

Colour Imaging for Your Archimedes



Desktop version of ChangeFSI supplied with all imaging products. Scanned image editing software is available to allow colour balance to be changed, image mixing and titling, cropping carried out etc in the 24 bit domain.

#### **Desktop Video**

Moving i-Mage is the first real-time windowing digitiser for the Archimedes. All screen update, scaling, zooming and image processing is carried out by dedicated hardware. This allows full-motion video to be displayed with millions of colours on the standard RISC OS desktop.

Comprehensive RISC OS compliant software is supplied which makes the sophisticated hardware easy to use. Or you can use your own software written in BASIC, C or Assembler etc. Third party support is available now from Allied Interactive and Westland System Assessment with many more to follow. Interface drivers are available for video disc players etc.

Moving i-Mage only takes one expansion slot. The upgradable digitising module can cope with existing and forthcoming video formats. A square pixel 24 bit colour upgrade already exists. CCIR 601 sampling digitisers and real-time compression hardware will be available very soon.

Moving i-Mage has found applications in many fields including Teletext Subtitling, Computer Based Training, Interactive Multimedia, Scientific Research, Presentation Video, Image Processing and Desktop Video Editing.

## Moving i-Mage Moving i-Mage

#### **Colour Scanning**

Professional and affordable 24 bit colour and 256 grey-scale scanning systems available for all Archimedes computers, using proven **Pro-i**mage software.

Pro-image renders, displays and compresses images whilst multi-tasking with other applications.

The widest range of file formats is supported including a complete range of sprites with up to 256 colours or 256 grey levels with Clear and industry standard compressed TIFF and JPEG

24 bit files. Huge images, limited only by disc space, can be scanned whilst **Pro-i**mage only takes a few hundred kb.

Pro-image recognises all A4 Epson scanners automatically.

Pro-tmage can also drive i-Scan (256 grey level version) and the complete range of Sharp scanners from postcard size JX-100 mini-flatbed up to A3 size. 35 mm slide scanners will be available soon.

Pro i mage



# Join the Could

It doesn't sing or dance or make pretty pictures. It's not exciting. You couldn't even say it was fun.

Yes, it's a **productivity tool** (yawn).

It just sits on one side of your screen and does nothing.

Except Save TIME

Time you could spend Rending, DrawBending, Scheming, PipeDreaming, Fontasising, EasiWriting, smArting, Swivling, Creating, Tracing, Impressing or Lemming.

TWO starts up your computer the way **you** want it. Applications running, directories open, files loaded. Other jobs waiting for the touch of a button (with TWO, one mouse click can do the work of fifty).

You will never have to remember to load a printer driver or hunt for that hidden directory again.

Enjoy a tidy desktop at last. (Or relax as your children/parents play games without wrecking your configuration).

TWO is simple to set up. No complex boot files to build – just drag things into a window.

And it's just as useful with RISC OS 3 (you'll probably find TWO a lot simpler than editing the desktop boot file).





# or your money back



Dept B32 1 Kington road, West Kirby WIRRAL, Merseyside L48 5ET

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Save on these productivity tools too:

QuicKey (for quicker keyboard short cuts using the mouse) £15

Padlock (guards your private files, with individual directory passwords and a master password for teachers) £10

TWO + QuicKey + Padlock £35

Combined site licence £95

All prices exclude VAT

Try TWO for two weeks. If you haven't joined the IDKHIMWI\* club by then, ask for your money back.

# PIPEDREAM4

Imagine a flexible word processor in which you can use fonts and pictures to give stunning presentation to your letters and reports. And a 93,000 word spelling checker and user dictionaries for letter-perfect writing.

Imagine the most powerful spreadsheet package on the Archimedes. Background recalculation so you carry on working while it computes. 160 built-in functions, plus a programming language for your own custom functions. Arrays within slots for easy manipulation of structured data.

Imagine dynamic charts straight from your data. Multiple scales to compare trends. Personalised Penguin Graphics with bars filled by your own draw files to dazzle your friends and colleagues.

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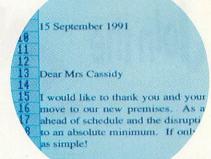
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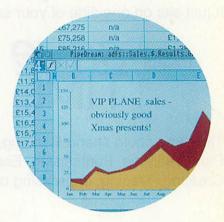
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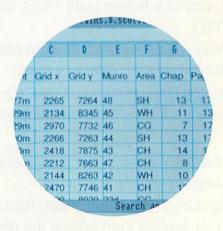
RRP £196+VAT. Call for education prices and site licences. PipeDream 4 is ideal for any Archimedes, A3000 or A5000 with 2MB RAM or more.

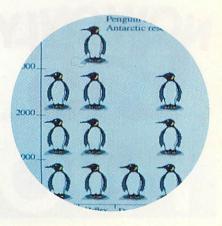
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#### **JULY 1992 ISSUE 120**



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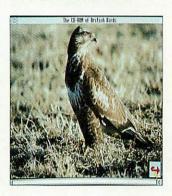
#### PRODUCED ON THE ARCHIMEDES

All the editorial pages in BBC Acorn User are produced on a DTP system using Acorn Archimedes 440/1 and A540 computers, Computer Concepts' Impression 2 with Laser Direct printers and Taxan monitors

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No Excuses Nominal Ledger

Note Invaders

Office Tools

Numbers and Pictures Numerator

Ollie Octopus' Sketchpad

Order Processing/Invoicing Minerva

**Numerator Chaos** 

Notate

Micro Studio £16

Fourth Dim £16

Fourth Dim £21

£34

£14

£29

Minerva

Superior

Lingenuity

Arcana Minerva

Longman

Chalksoft

Chalksoft

Longman

Silicon

Storm

£21

£78 £52 £20

£20 £60

£19

£276

House of Numbers

Chalksoft £20

Orion	Minerva £8•	RiscBASIC	Silicon £112	Twin Acom £24	
Orrery	Spacetech £93	RiscForth Compiler	Silicon £110	Twin World UBI Soft £14	
Ovation	RISC £85	Risc OS Companion Vol 1	Oak V0 £49	TWO (Task and Window Organiser) ICS£15•	
Overload	Clares £13	Risc OS Extras 1992	Acom £9	- site licence £60	
Pacmania	Domark £16	Risc OS Programmer's Reference Manual	Acom Vo £79	TypeStudio RISC £43	
Padlock	ICS £10	Risc OS Style Guide	Acom V0 £79 Acom V0 £11	Utility Disc 1 Data Store £8	
- site licence	£30	RoboLogo	Silicon £69	Utility Disc 2 Data Store £13	PRODUCTION SOUNDS SOUNDS AND ADDRESS OF THE PRODUCTION OF THE PROD
Pandora's Box	Fourth Dim £21	Rockfall	Eterna £16	Utility Disc 3 Data Store £7	ATT 00T 1000
PC Access	Minerva £19	Rotor	Arcana £19	Utility Collection Data Store £21	051-625-1006
PC Emulator	Acorn £85 Longman £47	Sales Ledger	Minerva £78	Vector 4mation £79.	
Pendown Pendown Etoile		Saloon Cars	Minerva £78 Fourth Dim £21	View»Mac 3 Human £65	
Pendown Outline Fonts	Longman £PQA Longman £19		Fourth Dim £POA	- Arc/Mac Cable Human £24	
Pendown Plus	Longman £68•	Schema	Clares £89	Vox Box Clares £47	Whisper Fan Quietener
Personal Accounts	Apricote £29	School Administrator	Minerva £65	Waterloo £23	(for A300/A400 series only) ICS £15
Pesky Muskrats	£21	Science, drawfiles	Micro Studio £25	Wimp Game Fourth Dim £16	
	west SEMERC £15	Score Draw	Clares £45.	Wonderland Virgin £24	Whicher Keeps the
Picture Book	Triple R £15	Scorewriter	EMR	Words and Pictures Chalksoft £17	Whisper Keeps the fans quiet
PinPoint	Longman £69	- PMS Dot matrix, Version	on 1 £127	World Championship Boxing Manager	Lans quiet
PipeDream 3	Colton £105	<ul> <li>PMS Dot matrix, Version</li> </ul>		Krisalis £20	
PipeDream 4	Colton £149•	<ul> <li>PMS PostScript</li> </ul>	£422	World Geography Maps, drawMicro Studio £23	HIGH DENSITY 31/2" FLOPPY DISCS
PipeDriver Dot 1	ICS £10	ScreenPlay	Widgit £35	World Map Study, age 7-16 ESM £42	
Pipe Mania	Empire £18	Screen Turtle	Topologika £36	World Wildlife, sprites Micro Studio £16	Pack of 10 £13
PIPP1 Primary Integrated P		Search and Rescue, age 9+		Worra Battle Oak £14	
DIDDO Desferalismal Interest	cis £36	Seashore Guide, drawfiles	Micro Studio £16	WorraCAD Oak £83	PRINTERS
PIPP2 Professional Integrat Project Planner	led	Sesame Street  - Letters for You	Electric Crayon £16	X-Fire Fourth Dim £21	ArcLaser 300-6 Calligraph £895
- 5-14 Programme	cis £85	- Numbers Count	£16		ArcServer 300-8 Calligraph £985
- Middle	CIS £52	SFXM	CIS £32•		Bubble Jet BJ-10e Canon £205
- Primary	CIS £44	ShapeFX	Data Store £10	Z88 PipeDream Guide Dabs V0 £15 Zarch Superior £14	Bubble Jet BJ10ex + TurboDriver
- Primary: Homes	CIS £12	ShareHolder	Silicon £135	Zelanites Superior £14 Zelanites Micro Power £18•	Canon/CC £248
- Resource Centre	CIS £129	ShowPage	cc £127	MILIOT ONE! L'IO	Bubble Jet BJ-300 Canon £360
- Secondary	cis £69	Shylock Gnomes, age 10-15			Bubble Jet BJ-330 Canon £405
Pirate, age 8-14	Chalksoft £19	Sigma Sheet	Minerva £38	HARDWARE	Bubble Jet BJC800 + TurboDriver
Placard	ics £10	SkyHunter	Longman £23	HANDWANL	Canon/CC £1889
- site licence	£30	smArt	4mation £50		Laser Direct HiRes4 with 50-sheet tray
		smArt Dinosaurs / Faces / F		A5000 COMPUTERS	CC £885
Placard now wo	rks with	Faces (German) / Fashio		ASSOC COMIT OTEMS	- 250-sheet Paper Cassette £99 Laser Direct HiRes8 CC £1280
sprites to	o!	Homes / Homes (French)		2Mb Hard Disc Colour System Acom £1499	Laser Direct HiRes8 CC £1280 Laser Direct LBP-4 Card CC £325
(Old disc plus 4 first class s	tamps to undate)	(German) / Leisure / Leis Leisure (German) / Look		- as above + Learning Curve £1530	LBP-4 Canon £659
(Gia disc pias 4 mot class s	tumpo to apouto)	Languages / Smartoons /		(Finance & special purchase schemes	Refill toner cartridge for Canon EPS £50
Plague Planet	Alpine £13	Gardens – each	4mation £15	available)	New toner cartridge for Canon LBP-4 £59
Poizone	Eterna £14	smArtFiler	4mation £32		
Poster	4mation £75	Snippet	4mation £26	MEMORY	SCANNERS, DIGITISERS
Powerband	Fourth Dim £21	SolidCAD	Silicon £115	Fitting extra unless otherwise stated	
Prehistoric Animals, sprites	Micro Studio £16	SolidsRender	Silicon £115	† Fitting easy	ArcScanner including Epson GT-4000
	Circle £71	SolidsRender SolidTools	Silicon £269		Clares £1660
Prehistoric Animals, sprites Premier – DataBase	Circle £71 Circle £25	SolidTools Spark	Silicon £269 David Pilling £5	A3000 2 Mb Non-upgradable † IFEL £55	FaxScan Clares £1660 Spacetech £94
Prehistoric Animals, sprites Premier - DataBase - WordProc	Circle         £71           Circle         £25           Circle         £25	SolidTools Spark Sparkle	Silicon £269 David Pilling £5 Morley £59	A3000 2 Mb Non-upgradable † <i>IFEL</i> £55 A3000 2 Mb Upgradable † <i>IFEL</i> £63	FaxScan         Clares         £1660           FX9600AT + Maintenance         \$pacetech         £94           Amstrad         £376
Prehistoric Animals, sprites Premier – DataBase – WordProc Presentation System	Circle         £71           Circle         £25           Circle         £25           Silicon         £61	SolidTools Spark Sparkle Special	Silicon £269 David Pilling £5 Morley £59 ICS £10	A3000 2 Mb Non-upgradable † IFEL 255 A3000 2 Mb Upgradable † IFEL 263 A3000 4 Mb † Atomwide/IFEL 2140	FaxScan Spacetech £94 FX9600AT + Maintenance Amstrad £376 Hawk V9
Prehistoric Animals, sprites Premier  - DataBase  - WordProc Presentation System Presenter GTi	Circle         £71           Circle         £25           Circle         £25           Silicon         £61           Lingenuity         £65	SolidTools Spark Sparkle Special – site licence	Silicon	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomivide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99	Clares   £1660   Spacetech   £94     FX9600AT + Maintenance   Amstrad   £376     Hawk V9   A3000 version   Wild Vision   £278
Prehistoric Animals, sprites Premier – DataBase – WordProc Presentation System Presenter GTi PrimeArt	Circle         £71           Circle         £25           Circle         £25           Silicon         £61	SolidTools Spark Sparkle Special - site licence Speech!	Silicon   £269	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 – as above + MEMC1a £149	Clares   £1660   Spacetech   £94
Prehistoric Animals, sprites Premier – DataBase – WordProc Presentation System Presenter GTI PrimeArt Printer Driver, RISC OS	Circle         £71           Circle         £25           Circle         £25           Silicon         £61           Lingenuity         £65           Minerva         £69	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week	Silicon         £269           David Pilling         £5           Morley         £59           ICS         £10           £30         \$30           Superior         £14           Chalksoft         £22	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a £149 — as above + MEMC1a £149 £220	Clares   £1660   Spacetech   £94   FX9600AT + Maintenance   Hawk V9   - A3000 version   Image (colour)   Light   Light   £589   Light   £58
Prehistoric Animals, sprites Premier - DataBase - WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS - BJ10ex TurboDriver + 6	Circle         £71           Circle         £25           Circle         £25           Silicon         £61           Lingenuity         £65           Minerva         £69           Cable         £248	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice	Silicon   £269	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a £149 — as above + MEMC1a + Ifiting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225	Clares   £1660   Spacetect   £94
Prehistoric Animals, sprites Premier  - DataBase  - WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS  - BJ10ex TurboDriver +  - BJC800 TurboDriver +	Circle         £71           Circle         £25           Circle         £25           Silicon         £61           Lingenuity         £65           Minerva         £69           Cable         £25           Cable         £28	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice Sporting Triangles	Silicon   £269     David Pilling   £5     Morley   £59     ICS   £10     \$230     Superior   £14     Chalksoft   £22     Ace   £29     CDS   £20	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a £149 — as above + MEMC1a + fitting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225 — as above + fitting £277	FaxScan FX9600AT + Maintenance Hawk V9 - A3000 version Image (colour) Image Scanner - Colour upgrade - Fast parallel card - Lighting unit - Clares Spacetect - £94 Wild Vision £199 Wild Vision £278 Wild Vision £278 Light size £283 lota £383 - Lota £383 - Lota £148 £98 - Lighting unit lota £91
Prehistoric Animals, sprites Premier - DataBase - WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS - BJ10ex TurboDriver + 6	Circle         £71           Circle         £25           Circle         £25           Sillicon         £61           Lingenuity         £65           Minerva         £69           Cable         £248           Cable         £28	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice Sporting Triangles Sports Day	Silicon   £269	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a + fitting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225 — as above + fitting £277 — as above + fitting £277	FaxScan
Prehistoric Animals, sprites Premier  DataBase  WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS  BJ10ex TurboDriver + ( BJC800 TurboDriver + ( CA (Canon PJ1080A)	Circle         £71           Circle         £25           Circle         £25           Silicon         £61           Lingenuity         £65           Minerva         £69           Cable         CC         £48           Cable         CC         £98           Ace         £15           Ace         £15	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice Sporting Triangles Sports Day	Silicon   £269	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a £149 — as above + MEMC1a + fitting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225 — as above + fitting £277 — as above + fitting £277 — as above + fitting + OS3 carriers £298 A5000 2-4 Mb Non-upgradable †	FaxScan
Prehistoric Animals, sprites Premier  DataBase  WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS  BJ10ex TurboDriver +  BJC800 TurboDriver +  CA (Canon PJ1080A)  CC (ColourCel)  Deskjet 500C TurboDri	Circle £7.1 Circle £25 Circle £25 Silicon £61 Lingenuity £65 Minerva £69  Cable CC £48 Cable CC £98 Ace £15 Ace £15 tver + Cable CC £POA•	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice Sporting Triangles Sports Day Square Route Stock Management Studio24Plus Version 2, age	Silicon   \$269	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a £149 — as above + MEMC1a + fitting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225 — as above + fitting £277 — as above + fitting £277 — as above + fitting £278 A5000 2-4 Mb Non-upgradable † Atomwide £88•	Clares   £1660   Spacetech   £94
Prehistoric Animals, sprites Premier  DataBase  WordProc Presentation System Presenter GTi PrimeArt Printer Driver, RISC OS  BJ10ex TurboDriver +  BJC800 TurboDriver +  CA (Canon PJ1080A)  CC (ColourCel)  Deskjet 500C TurboDri	Circle	SolidTools Spark Sparkle Special - site licence Speech! Spelling week-by-week Splice Sporting Triangles Sports Day Square Route Stock Management Studio24Plus Version 2, age Studio24Plus Version 3, age	Silicon   \$269     David Pilling   \$55     ICS   \$210     Superior   \$214     Chalksoft   \$222     Ace   \$229     CDS   \$200     Solective   \$220     Omputer Eyes   \$216     Minerva   \$278     E11+ EMR   \$210	A3000 2 Mb Non-upgradable † IFEL £55 A3000 2 Mb Upgradable † IFEL £63 A3000 4 Mb † Atomwide/IFEL £140 A310 2 Mb Upgradable soldered ‡ IFEL £99 — as above + MEMC1a + fitting £200 A310 4 Mb soldered + MEMC1a ‡ IFEL £225 — as above + fitting £277 — as above + fitting £277 — as above + fitting + OS3 carriers £298 A5000 2-4 Mb Non-upgradable †  Atomwide £88- A5000 2-4 Mb Upgradable † Atomwide £109	FaxScan
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<sup>\*</sup>These interfaces include some but not yet all of the ideA'92 features.



#### NATIONWIDE SPORTS CHALLENGE

READERS of BBC Acorn User are being invited to pit their skills against the best of British athletes. As revealed exclusively in last month's BAU Game Show column, British Olympic athletics stars - including Fatima Whitbread - have been lined up for the launch of Quest for Gold, a new five-event athletics simulation for the Archimedes by Krisalis Software.

To coincide with the launch of the Acorn version of the simulation, a nationwide Acorn Challenge is being set up on Saturday July 4, encouraging players to go to a local Acorn dealer and pit their skills against the Olympic athletes featured simulation.

Developed in close co-operation with Fatima Whitbread, the game includes a host of star athletes including: Linford Christie, John Regis, Sally Gunnel, Yvonne Murray, Colin Jackson, Dalton Grant and Steve Backley.

Each player will have to train their team and then compete in one of five simulated athletics events. Each competitor will receive a certificate, with the opportunity of winning one of several hundred



Top athlete Fatima Whitbread invites readers to take the Acorn Challenge

prizes, including T-shirts and posters. The winners of the regional heats will be invited to the national final in August, with the chance to win a family trip to a 'major athletics event' and to meet the athletes.

Anyone wishing to get some practice in prior to the Acorn Challenge on July 4 can obtain a copy of Quest for Gold from their local Acorn dealer. For a list of locations for the Acorn Challenge, tel: (0800) 678888.

#### ACORN'S SHARE PRICE TAKES A LEAP

ACORN'S share price leapt up almost athletically following the publication last month of the company's end-of-year financial results. In the space of just one month Acorn shares rose from just 6p to 28.5p, a 375 percent increase. According to a Stock Exchange source, demand for Acorn shares outstripped supplies and we know of several disappointed potential buyers.

Acorn's managing director, Sam Wauchope, told BAU that he was pleased that the share price had finally got off the ground: 'There was no way that the 6p price earlier this year did Acorn's true value any justice,' he said, 'At this stage I'd be happy with the

price holding at around 25p, which roughly values the company at about £17 million.

Exactly why Acorn's share price rocketed is not easy to pinpoint. Wauchope thinks that it was a combination of, rather than any specific, factors, which included the better than expected second half of the last financial year figures and publicity regarding the recent Tesco 'Computers in Schools promotion' (see page 13 for more details).

Another factor was probably speculation regarding the potential success of Acorn subsidiary, Arm Ltd. Last month we brought news of Arm's new 610 Risc processor, while in the States there has been

much speculation that Apple is to use Arm technology in revolutionary new products (see story top right).

Acorn does not stand to gain much cash benefit from Arm Ltd unless a shareholders' dividend is issued, but being a 46 percent shareholder, that proportion of Arm Ltd's future profits will show up on Acorn's bottom line. If Apple succeeds in boosting Arm Risc technology, many new doors into the lucrative embedded processor market could at last be opened. As we went to press, Acorn's shares had floated back down a few pence to around 24p - still 300 percent higher than the previous month's 6p low.

#### **NEWS IN BRIEF**

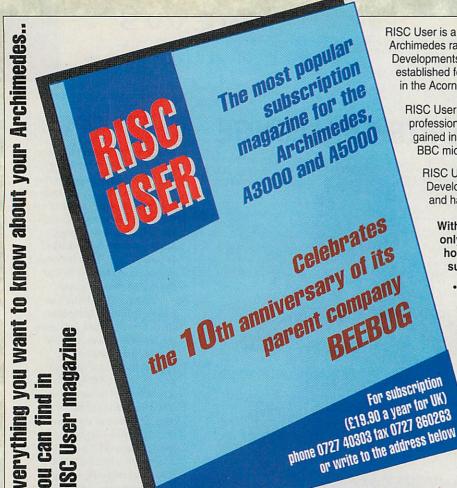
 UNOFFICIAL reports from the USA have hinted that the first fruits of Apple Computer's investment in Arm Ltd were due to be unveiled at a major consumer electronics exhibition in Chicago just before we went to press. Apple and Acorn have shares of 46 percent each in Arm Ltd, while chip manufacturer VLSI Technology has the remaining share.

Leaks emanating States-side indicate that Apple is about to unveil a revolutionary Arm-based pen-sensitive pocket computer, code-named Newton, which Apple describes as a 'personal digital assistant' (PDA), Indications are that the Newton is Filofax-sized and will accept hand-written input via a pen-sensitive LCD screen. Projected pricing is around \$750 (£325). Our information is that the Newton PDA has a completely new operating system and is unlikely to be software compatible with Risc OS, or even Apple's own Macintosh operating system.

Last year Apple confirmed it was to utilise Arm processor technology, probably the new Arm 610, developed from the family of chips used in the Acorn Archimedes computer. Apple's senior technical development director has publicly praised the Arm saying it is ideal for portable applications because of its compact design and very low power consumption in relation to its computing power.

BAU is covering the Consumer Electronics Show in Chicago and if Apple does launch the Newton, we hope to be the first to bring detailed news.

 AN ANNUAL subscription service for Archimedes users fearing the threat of software viruses has been launched by Pineapple Software. The £24 plus VAT nonprofit making service buys a database of all known Archimedes software viruses, plus a suite of protection software utilities developed under licence from Acorn. The disc will be updated regularly and registered customers will have access to an onsite anti-virus service in cases where extreme problems have developed. Contact Pineapple on 081-599 1476.



RISC User is a high quality magazine devoted totally to the Archimedes range of computers. It is published by RISC Developments, formed last year from BEEBUG, which has been established for over ten years as one of the foremost companies in the Acorn market.

RISC User is produced by a dedicated and enthusiastic professional team which benefits from 10 years of experience gained in publishing the popular BEEBUG magazine for the BBC micro and the Master 128.

RISC User can also call upon BEEBUG's (now RISC Development's) considerable expertise as a major software and hardware developer for the Archimedes range.

With a RISC User subscription you will receive not only 10 magazines a year (delivered free to your home), but you will benefit from all the help and support a professional organisation can provide:

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- RISC Developments' own range of high quality hardware and software with special discounts for magazine subscribers
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offers much to the user... a good deal of Acorn User thought has evidently gone into its evelopment... .. a worthwhile upgrade from Edit development...

replete with well thought out and Archimedes World flexible features... very attractive... remarkably inexpensive for what it offers... should prove very popular.

...a wonderful piece of software... deserves to be on everyone's icon bar... Acorn would do well to provide it free with every would go well to provide it free with every machine it sells... so much (is provided) that you wonder how you managed before. ..macros are...a boon and of great value when writing a program... a truly marvellous set of page and printer control options are included... Everything I wanted was there with clear instructions for use.DeskEdit is a must.

#### DeskEdit

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Existing users may upgrade to V. 1.20 by sending their original disc, together with £2.00 and SAE marked **DeskEdit Upgrade 1.2.** 

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ChartWell offers 24 different graph types:

horizontal and vertical bar charts line graphs scatter charts polar plots and pie charts.

#### Complete user control over:

choice of colour, data point styles, bar widths and spacing, use of titles and labels, legends to provide a key, graduated/shaded backgrounds, scales and tick marks, etc.

#### has enough effects to present material prettily at a price that makes it attractive to the home or school user.

#### the same type of graph again...

... This program from RISC Developments uses a really clever approach exploiting the desktop philosophy to the full.

Data can be imported from other

applications, such as spreadsheets, databases,

or created with a suitable editor as a text file.

Output is in standard Draw format.
Use of 'style sheets' allows a set of options

...All the options chosen can be

saved in a 'Style Sheet file which

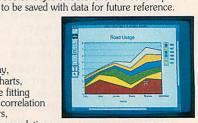
makes it remarkably easy to create



#### A variety of display options:

flat or 3D bar and pie charts, user choice of angle for 3D display, clustered, stacked or layered bar charts, scatter graphs with choice of curve fitting techniques, regression lines and correlation coefficients, and use of error bars,

line graphs with choice of normal, cumulative area or stacked area displays.



Chartwell and manual £29.95 inc +2.00 p&p

#### **TECHWRITER HITS RIGHT FORMULA**

LOOKING for an advanced word processor that can deal with complex formulae? Then Icon Technology's Techwriter could be the answer.

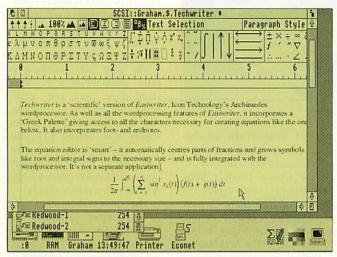
Described as 'Easiwriter's big brother', Techwriter has all the features of the former, but includes formulae creation and editing and does not require a separate application to create Draw files. Users can simply create a formula using a menu option.

Components of the formula are then chosen using a scrolling 'palette' of Greek characters and symbols at the top of the Techwriter window. As the formula is created, Techwriter intelligently positions the caret where the next variable will go - for instance, creating a fraction will mean that the caret moves to the numerator, then the denominator. The formula can be edited by using the cursor keys to step though each individual component.

The basics of Techwriter come from Formulator, which is widely used in the Apple Mac world, particularly in research and educational establishments. Users include Professor Stephen Hawkins' group at Cambridge University. Techwriter and Easiwriter

documents will be interchangeable, although initially Easiwriter will not load Techwriter files.

Techwriter will cost around £250 plus VAT will be available later in the year. For more details contact Icon Technology on (0533) 546225.



Techwriter from Icon Technology - impressive formulae creation abilities

#### A FLOPTICAL ILLUSION?

A STORAGE capacity of 21Mb on a single 3.5in floppy disc drive? Impossible? Not with the new generation of Floptical disc drives.

Floptical is a development of conventional floppy disc technology and uses microscopic optical grooves to ensure accurate tracking of the read/write head. Track densities are increased ten-fold, hence the 21Mb storage.

Add to this the fact that Floptical drives are also compatible with conventional PCformat 1.44Mb quad or high density discs and it is easy to see why a handful of Archimedes peripheral manufacturers have taken a keen interest in the new technology.

Floptical potentially solves the problem of the lack of a high density floppy drive in all Archimedes machines, besides the A5000, which has one. It can also double as a hard disc backup device.

The potential Archimedes market was considered important enough by one of the US manufacturers of Floptical Peripherals, drives, Insite which has been working with Acorn to ensure optimum compatibility. Initial supplies of drives, which require a SCSI interface, could only be used in proprietary 21Mb mode, or HD mode.

According to Morley Electronics' Michael Fodden. Insite has been busy modifying its drives' firmware to accommodate ADFS 800K and 1.6Mb (Risc OS 3/A5000) formats. Fodden would like to sell Floptical drives as replacements to standard 800K drives fitted to existing machines. The drive can be fitted internally to an A5000 without the need to displace either the standard floppy or internal hard drive. Unfortunately, due to a quirk in Risc OS 2, there is a problem when swapping Floptical discs - there is no 'dismount' them. way to However, Risc OS 3 does recognises high capacity, interchangeable media.

Floptical drives are available from Morley, DT Software in Cambridge and The Serial Port in Somerset. Drives cost around £500 depending on fitment. The 21Mb Floptical discs cost around £25 each.

#### CLASS EFFECT

ORION Computers, Preston-based Acorn dealer which went into voluntary liquidation in February this year, has been bought by David Atherton. Atherton was a regular contributor to BBC Acorn User for many years and co-founded Prestwichbased Dabs Press - which calls itself the 'premier Acorn book publisher' - with ex-BAU staff member, Bruce Smith.

Atherton, who was on the of Orion's creditors, bought the company from the official receivers and saved the company and the jobs of three of its five employees.

The new company is called Class Effect Ltd, trading as Orion Computers. Atherton is apparently not liable for the old company's debts, but he told BAU that he is willing to honour guarantees and aftersales support to customers who bought goods from Orion Ltd up until that company's demise in February.

For further information, contact David Atherton at Dabs Press, 22 Warwick Street, Prestwich, Manchester M25 7HN. Tel: 061-773 8632.

#### **NEWS IN BRIEF**

 TWO companies, Irlam Instruments and Allied Interactive, have joined forces to develop multimedia products for the Archimedes

Irlam's acknowledged expertise in imaging products will be matched with Allied Interactive's software support. The first product of the collaboration will Irlam's new Moving i-Image product, which is designed to control various video playback hardware. Contact Irlam Instruments on (0895) 811401.

- SILICON Vision has released new driver software for its Arc-PCB circuit board design packages. The driver enables industry standard Excellon Drill files to be generated for operating drilling machines. Excellon files are widely supported as a standard format in the printed circuit board manufacturing industry. The driver costs £75. Contact Silicon Vision on 081-427 5169.
- A QUIZ game for Archimedes users based on the adventures of the biblical character Elijah has been released by Evangelsoft, specialists in Christian computer games. The Adventure of Elijah Quiz was overall winner of a Bible Software competition at last year's Christian Resources Exhibition. For more information, contact Word Service on 081-949 2733.
- A Risc OS 3 version of Ace Computing's printer driver for the Hewlett-Packard DeskJet 500C, PaintJet and PaintJet XL colour inkjet printers has been released. Resolutions of 75-300 dots per inch are supported and printing is helped by data compression.

The release follows the success of Ace's Risc OS 2 driver, which it says has been selling very well. Like all Ace Computing's drivers, the price is £18.80 including VAT. Contact Ace Computing on (0223) 322559.

 STAR Micronics UK has been confirmed as the top supplier of printers in the UK. Star took a 17.5 percent market share by volume, 1.4 percent ahead of Hewlett-Packard.

The company is best known for dot matrix printers and in this sector it has over a quarter of the existing market.

#### NEW CD-ROM PACKAGE | USER PORT ADDITION



Acorn and Cumana's joint CD package

ACORN and Cumana have combined to offer special CD-Rom-based A5000 package costing just £1799 plus VAT.

The system comprises Acorn's latest A5000 computer, a CD-Rom drive and SCSI interface, plus a compendium of seven CD-Rom discs aimed at educational customers.

Software supplied includes the new Revelation2 painting and image processing package from Longman Logotron. Also included are Space Encyclopaedia, The Hutchinson's Encyclopedia and The Times and Sunday Times Sampler which contains archived newspaper articles from January to June 91. There is also an Illustrated Shakespeare and a disc which contains all 60 of Arthur Conan Doyle's Sherlock Holmes' stories, plus The Illustrated Holy Bible - which, incidentally, BAU comms columnist Paul Vigay helped to port over to the Archimedes.

Further incentives include a £25-off voucher for a year's subscription to the Neris educational resources database on CD-Rom and a £30-off voucher for a year's subscription to The Times and Sunday Times CD-Rom archives.

For further information, contact Cumana on (0483) 503121.

#### **MORE FROM MINERVA**

MINERVA Software has been outlining some new software packages to be released during this summer. Firstly, a completely new version of its EasiWord word processor, which will probably be known as EasiWord 2, is expected this month. This will replace the existing version of EasiWord, which forms part of the Desktop Office business suite. EasiWord 2 is an entry-level word processor and does not use Risc OS outline fonts. A price for EasiWord 2 has not vet been set, but its natural competitor is the now-ageing First Word Plus package.

Minerva says that the application will appeal to users with nine-pin dot matrix or daisywheel printers, which are better or faster at printing characters rather than graphics.

Also in the wings is a fully featured word processor which does use Risc OS fonts. This will be called Prime Word and will compete with likes of EasiWriter from Icon Technology. Minerva have not yet set the price, but say that Prime Word should be available in August or September.

Minerva's entry-level Cad package called CADet priced £149 will be followed up by a professional version called ProCAD to be released in October. ProCAD is capable of managing drawing sizes up to A0 and will cost about £500. All the new releases will be demonstrated at our show at the Wembley Conference Centre (October 16 to 18).

For further information, contact Minerva Software on (0392) 437756.

IN RESPONSE to customer feedback, mainly from the sector. Risc education Developments has released a revised range of internal IDE hard drives for the A3000 which now incorporate a user port interface at no extra cost. The interface was added mainly because teachers otherwise found they were unable to connect Concept Keyboards to their A3000s while an internal hard drive was fitted.

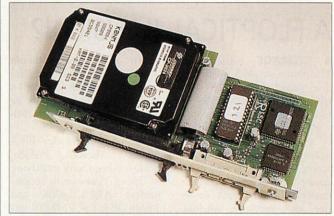
The user port interface is fully compatible with other stand-alone user port cards which are currently available. An optional external power supply unit, priced £17 plus VAT, is available to drive the user port in case certain user port peripherals overload the A3000's own power supply.

The drives themselves are 2.5in devices available in 20Mb (£195 plus VAT) and 40Mb (£359 plus VAT) sizes. An 80Mb version is planned.

 Meanwhile, owners of the venerable A300 series Archimedes, (like our news editor), are currently spoiled for choice when it comes to upgrades to overcome the machine's 1Mb Ram limitation. There must be plenty of the old workhorses out there because Developments has added a 4Mb upgrade for the A305/ 310. Risc Developments claims its upgrade is the smallest yet and is user-installed in less than half an hour without any soldering.

Two multi-layer circuit boards are supplied and the installation will accommodate Risc OS 3 Rom chips once they become available as upgrades.

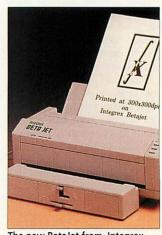
The Ram upgrade is priced £269 plus VAT, including a Memcla memory controller chip upgrade. For further information contact Risc Developments on (0272)40303.



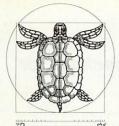
Risc Developments' internal hard drive with user port

#### NEW INTEGREX PRINTER

INTEGREX Systems Ltd, best known for its range of colour printers, has announced the addition of a monochrome 300dpi inkjet which is claimed to be near laser quality. The Betajet is quiet and light, weighing just 2.9kg. The PCL 3 printer language is supported, as are HP Deskiet Plus, Epson FX850 and IBM Proprinter emulations. Another feature is the mess-free ink cartridge replacement and there is a selection of font cards and memory upgrades. It costs £299 plus VAT. Contact Integrex on (0283) 551551.



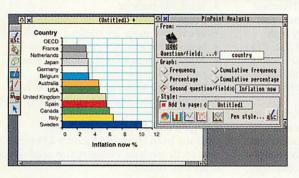
The new BetaJet from Integrex

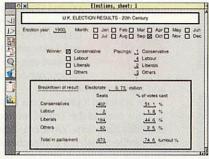


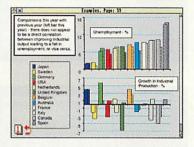
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LONGMAN Logotron **S** The ease with which data collection may be organised and implemented is a joy.

Frank Jukes, Micro User, January 1992







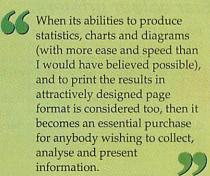
Examples, Page: 5

PinPoint is certainly a new generation database, making the handling of data as easy as it should be. Its concept and execution is brilliant — data handling is about collecting data efficiently, and that is what PinPoint does. PinPoint is powerful yet simple to use and will take educational data-handling into a new era.

Dave Futcher, BBC Acorn User December 1991



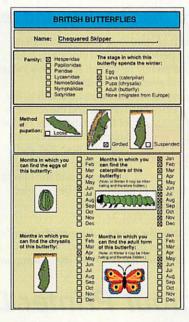
Pinpoint takes databases into a new dimension in several ways. First, form design. PinPoint is about as adaptable as the best desktop publishing package when it comes to creating the form upon which information

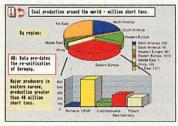


will later be entered and

stored.

Chris Davies, Times Educational Supplement, November 1991





**Longman Logotron** 124 Science Park Milton Road Cambridge CB4 4ZS.

Tel. (0223) 425558 Fax (0223) 425349



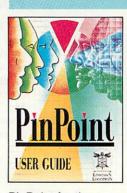
Has Longman Logotron developed a new form of database altogether? In one word yes. To call PinPoint a mere database, or even mildly more boastful, a new generation database, is to diminish what in truth is a revelation.

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The scope and variety of PinPoint is quite astonishing. The sheer variety, the power, the complexity of this program is astounding. The analysis and display aspects are both powerful and attractive enough to operate in both an educational and business environment. Databases will never be the same after this.

**Duncan Evans, Archimedes World** December 1991



PinPoint for the Acorn Archimedes is priced at £99. A Site Licence costs £400.



A special version for primary schools is priced at £24. A Site Licence costs £72.









#### Hearsay II

#### The most advanced communications package for Archimedes systems.

Hearsay II is a multi-tasking and fully RISC OS compliant communications package designed for easy communications for the first-time user, but with a wide range of advanced features making it the professionals choice.

It is ideal for use with Prestel, Telecom Gold, Campus 2000 and Compuserve, and

also provides very high quality VT320, VT102, VT52 and Tektronix 4105 Colour terminal emulations for direct connection to mini

and mainframe hosts.

In addition it gives access to Minitel systems such as the Teletel service and provides Xmodem, Ymodem, Zmodem and Kermit file transfer, a comprehensive script language and an auto-dial number directory.

- · Fully RISC OS compliant
- Multi-tasking and background transfers
- Scalable terminal windows
- Xmodem, Xmodem1K, Ymodem, Zmodem, Kermit, SEAlink, and ASCII file transfer
- Batch file transfer
- Script language based on a subset of C
- Macro processor and definable keyboard
- Support for RISC OS printer drivers
- Number directory with auto-logon and password protection
- MNP 2 and Vasscom error correction
- Supports most popular modems e.g. Hayes

#### Upgrade to version II

Upgrade from Hearsay I for only £35 plus VAT plus £3.10 carriage. Please return original disc to address below.

'It does everything we want, and is a pleasure to use.' ARCHIVE Ian 92 Background data transfer, a well documented script language and high RISCOSity make this a ARCHIMEDES WORLD April 92 powerful contender ... '

...the manual is an excellent example of thoroughness and clarity...Hearsay II is a very good communications package and is thoroughly recommended... ACORN USER May 92

#### Hard Disc Companion II

#### Hard disc backup and retrieval

Version II of Hard Disc Companion offers superior performance and efficiency. It has been completely re-written and is now twice as fast and even easier to use.

It provides a structured approach to the backing up of hard drives, and the recovery



of files in the event of disc failure or accidental file deletion. Both Full and Incremental backups are supported, and the files to

be backed up or ignored may be specified using simple drag operations.

The entire backup specification may be saved in a script file for use at a later date. Hard Disc Companion II uses an efficient compression system to backup as much data as possible onto the floppies without increasing the backup time.

Separate applications are included to restore entire backups or just selected files.

#### Upgrade to version II

Upgrade from Hard Disc Companion I for only £15 plus VAT plus £2 carriage. Please return original disc to address below.

'Good value for money...A nearly foolproof interface...Hard Disc Companion keeps things simple and as fast as possible.. MICRO USER May 92 ARCHIVE Apr 92

"...it is certainly the best hard disc backup utility that I have ever used."

#### Colour Printer Drivers

#### For HP DeskJet 500C and Star colour printers

The PrinterDJ printer driver produces near laser quality output from the highly acclaimed Hewlett Packard DeskJet 500C colour

Both release 2 and release 3 C15 each drivers are supplied, each supporting 75 x 75, 150 x 150 and 300 x 300 print resolutions in monochrome, grey scale and full colour modes.

PrinterLC is the approved printer driver for Star colour dot-matrix printers. It is suitable for

both 9 and 24-pin printers including: LC24-200, LC-200, XB24-10 and LC-10. PrinterLC is a release 2 driver, supporting print resolutions from 60 x 72 dpi to 360 x 360 dpi depending on

the printer model. Also suitable for many Epson and NEC colour printers.



#### **TESCO SCHEME: £4.5M-WORTH OF COMPUTERWARE FOR SCHOOLS**

OVER £4.5 million-worth of Acorn computerware expected to be distributed during the next two months to schools throughout the UK, thanks to the recent Tesco 'Computers for Schools' scheme, run in conjunction with Acorn Computers.

Although the scheme finished in-store on May 31, schools who have registered with the scheme have until June 15 to send their vouchers in to the 'Computers for Schools' mailing house.

The scheme attracted over 15,000 schools and was described by Tesco's national marketing manager, Jenny Gilmore, as 'the most successful we have ever run'. So far, over 22 million vouchers have been given to customers, who received one voucher for every £25 they spent in Tesco stores. Vouchers are redeemable against Acorn computers and software listed in a special catalogue.

Tesco reported that it received up to 200 calls per day from schools wanting to be involved with the scheme, which is why the closing date for issuing vouchers in-store extended by two weeks.

Acorn's marketing director, Mike O'Riordan, said that the scheme had been an enormous success and that the company would be assessing its impact, with a view to discussing whether it might be feasible to run a similar scheme in the future.

Schools throughout country have been enlisting the help and support of their communities in collecting vouchers. Firemen and nurses have been collecting vouchers for schools in Essex and Northamptonshire; ations in Warwickshire have adopted local primary schools for collections; and ambulance staff and police in Avon have also been collecting for local schools.

Many schools set their sights high and tried to obtain at least BBC A3000 (3000 one vouchers). Some even managed to gain enough vouchers for two machines, while other schools pooled their vouchers to buy machines which could be shared.

If your school has been involved with the scheme, why not let us know what initiatives you took to collect vouchers and what you managed to achieve? If you have pictures as well, so much the better. We will publish the best stories in a future issue.

 Meanwhile Acorn's competitor in the education market, Research Machines, apparently sent a letter to schools encouraging them to collect enough vouchers for the Acorn JP150 printer, which is also compatible with RM's Nimbus computers. RM then suggested (rather cheekily) that schools might want to buy a connecting lead from them for £12!

#### DISTRIBUTION **CHANGES?**

SPECULATION has been rife in recent weeks concerning the future of two of the three main distributors of Acorn products.

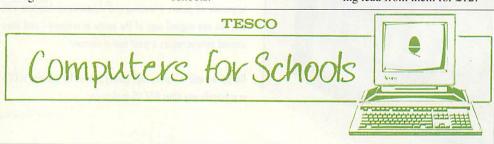
Reports which appeared in Computer Trade Weekly and The Times Educational Supplement have suggested that the future of Bonsai Distribution and possibly AB as Acorn official distributors may be in doubt. Bonsai was involved in a takeover of the former Acorn distributor, Kelator, last year.

Although we were unable to obtain official confirmation of the stories from any of the parties involved, it is generally thought that Acorn is intent on stepping up its own direct distribution efforts, cutting out the third- party distributor stage.

There is concern among Acorn dealers that if Bonsai ceases to continue as an official Acorn distributor, it will pull out of the Acorn market altogether. This could mean it will be more difficult for some dealers to stock products from Acorn third-party hardware manufacturers such as Beebug. HCCS, Morley, and so on. This is because, of the three Acorn distributors, only Bonsai offered these products in any quantity in its catalogue.

Dealers we spoke to had mixed feelings about the news. Some rely heavily on centralised buying from Bonsai and AB, as well as from the third official Acorn distributor, Hugh Symons. One dealer we spoke to said he would seriously consider quitting the Acorn market if Bonsai stopped supplying Acorn-related products. On the other hand, Adrian Calcraft of Beebug/ Risc Developments said his company had reduced its dependence on selling its hardware upgrades for the Archimedes via Bonsai in recent months and was dealing directly with dealers.

At the time of going to press, Acorn was unable to give us an official comment concerning its plans for direct product distribution, but we hope to have further details in next month's issue.



#### NEW PROFESSIONAL COLOUR OPTION

A NEW, large format colour inkjet printer - the PaintJet XL300 - has been launched by Hewlett-Packard. Aimed to compete with Canon's BJC800 colour inkjet, the XL300 can accept paper sizes up to A3 and is LaserJet III compatible.

Printing at 300dpi (dots per inch) resolution is via four 50nozzle ink cartridges; one each for cyan, yellow, magenta and black (CYMK). The 24-bit colour compatibility provides selection from a palette of 16.7 million hues and the inclusion of black should ensure print quality is substantially better than with cheaper colour printers.

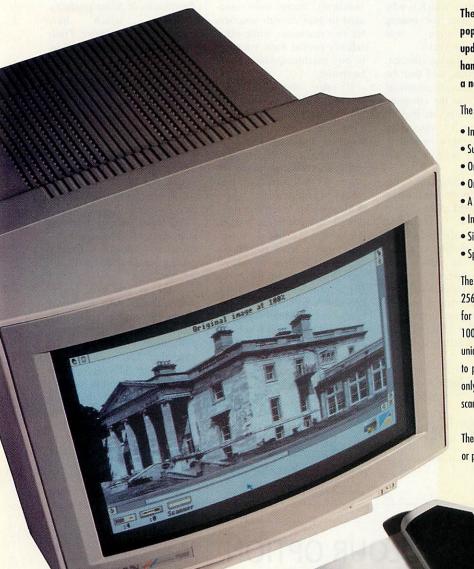


The XL300 appears to be aimed squarely at Canon's launched BJC800 recently colour inkjet, which has a similar specification. The

XL300 has a recommended price of £2895.

For further information. contact Hewlett-Packard on (0344) 369222.

# SCANNING ISBELIEVING



The ScanLight range of scanners has become the most popular for the Archimedes. We now introduce a new updated version of ScanLight 256, a true 256 greyscale hand held scanner, along with new scanner software and a new low price.

The ScanLight, version 2 software, now offers;

- Instant image rotation by any angle
- Support for the new RISC OS 3 true 256 grey-level sprite format
- Only one copy of the image in memory at once
- On the fly screen-dithering for maximum quality
- A selection of sampling sizes from 2x2 to 8x8
- Image enhancement facilities such as sharpening, edge detect etc.
- Simple brightness and contrast controls
- Spline curve control over grey-map for additional control

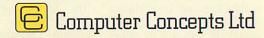
The scanner itself now offers a maximum resolution of 400 dpi true 256 grey-levels at full 105mm width. In addition there is support for monochrome, 16 grey-level and 256 grey-level scanning at 100, 200, 300 and 400 dpi. The ScanLight software offers several unique facilities that make it the leader in its field - e.g. the ability to provide all picture processing and enhancement functions with only the one original copy of the image in memory - vital since scanned pictures require a great deal of memory.

The perfect way to capture high quality pictures for inclusion in DTP or practically any other RISC OS application.

ScanLight 256, scanner, interface board and software-£199.00+VAT (£233.92 inc.)

Suitable for all Archimedes models and Operating System versions. An internal A3000 version is available for the same price. Please specify when ordering.





#### GRAPHICS



#### WORKS OF ARC IN COMPUTER ARTIST'S EXHIBITION

FROM the first time a caveman saw fit to decorate his cave walls with pictures and designs, the question 'What is art?' has been the favoured topic of many a conversation.

When photography tried to establish itself as an art-form, it suffered much criticism from 'traditional artists'. Computer art appears to be receiving the same treatment, although there are a number of exponents striving to prove them wrong.

One such artist is Pete Worrall, a fine-arts graduate who is using the medium of the Archimedes computer screen to convey his ideas. Designs are produced using the Arcol paint package, then a photograph is made of the screen and blown up for framing.

An exhibition of Pete's work, titled Electric 534, will be on show between 23rd May to 27th June 1992 at the Wednesbury Art Gallery in Wednesbury, West Midlands. For more details, contact the gallery on 021-556 0683.



Holy man, just one of the stunning works of art seen in Pete's exhibition

#### CHECK IT OUT IN THE PICTURE BAY

THIS MONTH sees the start of a new series of hints and tips to help you to get the most from art and design packages for Acorn machines.

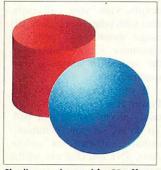
Anyone who has a problem with their pixels can drop a line to Picture Bay and we promise that we will do our best to help. On the other hand, if you have the answer to someone else's question, we would be happy to publish the solution.

To start off, we'll take a look at flood-filling; a tool that is sometimes confusing to use. A flood fill is simply a method of colouring in an area bounded by lines of a different colour. They are not usually limited to a single colour, but will allow patterns to be used as well. Most art packages come with a number of predefined designs.

Rather than the painstaking process of drawing a wall by hand, why not design a brick pattern and use this to fill the area? This leads us on to a few hints and tips for designing fill patterns.

 Make sure that a pattern will look right when repeated over a large area. It's easy to produce designs with horizontal vertical lines, but diagonals can be quite tricky.

• Using patterns, it is possible to create 'new' colours by dithering existing ones. Dithering is the alternate placing of pixels in a chess-board arrangement. The higher the resolution you use, the more



Shading can be used for 3D effects

colours will appear to blend, so it's possible to create a large number of shades in a high-res 16 colour mode.

 Some art packages will allow transparent pixels to be used in pattern designs. This lets you colour over areas while effectively being able to see the picture behind.

In addition to straight forward colours and patterns, some programs allow graded fills for areas. Most provide a selection of grades that can be used. Colouring an area from a dark to a light shade is an easy way of adding depth to a picture and the picture on the left shows the kind of effects that can be achieved.

• The final type of fill is the circular graded-fill. floods an area outwards from a central point. It is best used for highlights, which can be created by choosing a scale of colours from the main colour to a brighter version.

Rob Miller

#### **DOOK IT**

BAU reader, Martin Chapman, has written in with a query about Risc OS 3 Draw. Martin finds that his latest pictures cause problems with some of his old software.

The reason that pre-Risc OS 3 programs are unable to handle the new Draw files is the presence of an extra object, used to describe current zoom, grid settings and so on.

In the case of 4Mations Poster, the extra 'object' will be loaded into a document at the bottom left hand corner of the page. Its presence becomes apparent if you group all objects together. The box enclosing the group extends to the bottom left hand corner although there is nothing there. Creating borders in Poster will also cause similar problems.

One solution is to use the Dook (Draw Options Object Killer) to remove unwanted object. This public domain utility is provided on the July subscribers' disc.



#### **KEEPING THOSE BILLS AT BAY**

ARE YOU sometimes shocked by the size of your telephone bill when it drops through the letterbox? Do you worry about the time spent reading messages, when you log on to distant bulletin boards?

Anthony Frost has come up with the answer in the form of Reader, an offline message reader. This proves an effective way to cut down on the time spent reading long messages while online.

However, Reader offers far more than just a simple reading facility. It can also organise messages from different

bulletin boards, reply to messages using its in-built editor and save all replies to a single file, before posting them back to the bulletin board next time you log on.

Reader works fully within the Risc OS environment, which means that you can simply drag an archived message file on to its icon. If Sparkplug is loaded at the same time, it can then de-compress the file and store all the messages in its own database.

It also sets up what is known as a thread. A thread is a set of linked messages sent as replies

to previous messages. By using this option, you can see if a particular message was in fact a reply to an earlier message. Reader will automatically route all replies together so that you can reference these to previous messages.

To send a reply to the message you are reading, just click on reply, type your reply and click on store. You can even quote lines from the original message. Anthony has also written a short utility program that allows you to place a random signature at the bottom of your reply.

Reader is invaluable as a way to keep archives of all messages sent to your regular boards. Moving bulletin through the messages is simply a case of dragging a mouse pointer through the file or clicking on backwards and forwards icons. Reader is a shareware product and a donation of £10 is recommended, which will be donated to charity. This represents excellent value, especially when you take your reduced telephone costs into account.

To place an order, you can contact Anthony either via The World of Cryton BBS (user number 332) or via Arcade BBS (user number 75).

#### HrcBBS Reader Hew Hsg Prev Vote Quote Junp Sign | Reply Hext Board : TWoC. Area 2 - general From : Matthew Ridd To: All |Sent: 18:84:87 88-rep-1 Subject: Janet Replies: 22498 | 8 Reply To: Can anyone tell me how I can Email people at University, on the JANET network other than through Compu\$serve. Is it possible to direct mail via Fidonet? Or one obtain a public mbx no. on Janet, and log-in to the system via BT's Diapl or Hercury's network? Any help greatly appreciated! Matty 1 SE 000 Reply to Area 2, Message 21996 Anthony Frost's new Reader software helps keep the costs down

The annual Networks 92 exhibition will be held at the NEC, Birmingham on 23rd - 25th June 92. Not only will leading network and modem suppliers be showing off new equipment, but visitors be able to attend free seminars and workshops throughout the three day event. Full details and advance tickets can be obtained from Blenheim Online, Blenheim House, 630 Chiswick High Road, London W4 5BG, tel: 081-742 2828.

IN BRIEF

 Dowty have just announced a new 'quinn' modem. The Quantum96 modem retails at £595 plus VAT and boasts a range of impressive features from a reasonably thin black box. The Quantum96 copes with all speeds and includes V42bis error correction. Dowty claim that this can boost the data throughput to four times the transmission rate.

A 'phase 2' model will be available within the next month. which has V32bis operation. Both machines will be compatible with group III fax machines. For more information, call Dowty Information Systems, tel: (0635) 33009

 Have you ever damaged, or blown, your modem mains adapter? Well, now help is at hand in the form of Manby Park Electronics of Lincolnshire.

MPE sell a whole range of new mains adapters from only £1.50 each. Their extensive range is detailed in the latest catalogue. Contact MPE on (0507) 328031.

 Another new modem has just been launched by Tricom. The price is currently unavailable but the list of features is certainly enviable, so expect a large dent in the bank account.

The Tornado 14/42 incorporates V32bis, v32, v22bis, v22, v23 and v21 and can have an average throughput of 30k bps. It is certainly interesting to see that the split v23 baud rate is still catered for, although little used except on some Viewdata BBS's.

Some extra features not usually found on modems are included such as password protected remote access and historic call statistics. Tricom can be contacted on (0494) 483951.

#### ALL CHANGE AT THE POWER HOUSE

A YEAR ago, I mentioned The Power House in this column. Since then the sysop, Edward Hobson, has certainly been busy and TPH has expanded beyond all recognition.

One important change, that will make a difference to accessing times, is that there is now a second line on (0829) 782667 which supports 300, 1200, 2400, MNP and 1200/ 75. The original Power House number (0829) 782676 now supports all speeds (except 1200/75) up to 14400 HST and includes v42bis.

Edward runs the BB on his IBM PS/2 model 80 armed with a 405Mb hard disc, but he has extensive coverage for Archimedes users including

the Acorn Support database run via the Fido network.

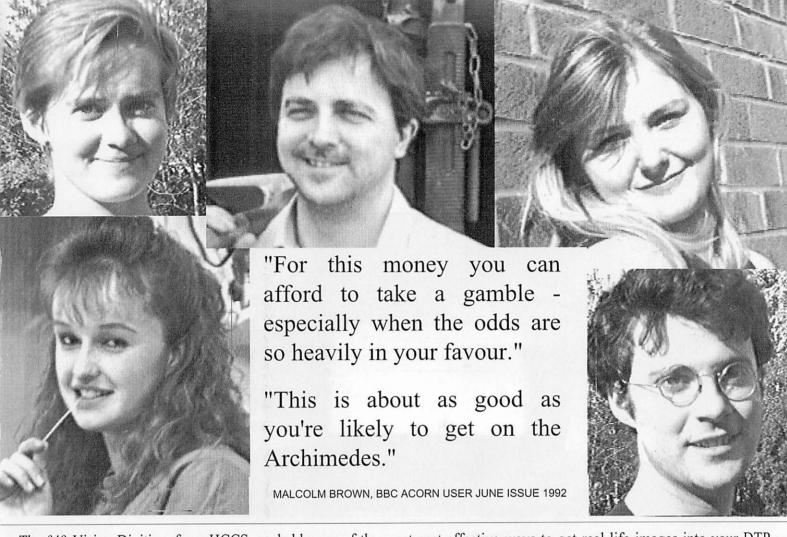
He also has a much extended entertainment menu, containing numerous online games. It even includes Ansi music, which supposedly plays music via Ansi control codes. Unfortunately my comms software does not support this novel feature, so I could not sample the potential delights of online music.

However, another feature is the ability to play a selection of online games including drag racing where you must race a car against the computer or even another online user.

One area that has grown enormously is the file area. I can imagine that a substantial amount of Edward's 405Mb Winchester drive is occupied by Archimedes downloads in the form of desktop utilities, demos plus various sound and graphic programs.

Another vastly expanded area is the utility area to enable you to change your account details, view your call costs, chat with other users, view BB usage graphs and generally customize various aspects of the system to suit your own requirements.

If you have not called The Power House before, it's certainly worth giving it a bell. To do so, set your communications software to colour Ansi, 8N1 and dial one of the numbers given above.



The £49 Vision Digitiser from HCCS, probably one of the most cost effective ways to get real life images into your DTP system with excellent quality! The Vision Digitiser takes a standard PAL Video signal produced by CamCorders, Video Cassette Recorders, some TV's and Canon Ion cameras. The source does not require a good still frame because the Vision Digitiser grabs frames in real time. With the £30 Colour upgrade available from the end of June with a £5 discount to existing users how can you justify not buying one. If you want to see one before you buy, ask your local Acorn dealer.

# Volument Vol

K9200 A3000 Internal Vision £49

K9202 A3000 External Vision £62

K9204 Archimedes Vision
(A300, A400, A540, R140, R260 & A5000)

on £49



HCCS ASSOCIATES LIMITED, 575-583 DURHAM ROAD, LOW FELL, GATESHEAD, TYNE AND WEAR. NE9 5JJ.

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PLEASE SEND ME	VISION DIGITISERS MODEL	BY RECORDED DELIVERY
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		VISA or ACCESS WELCOME
POST CODE		NAME:

# Every few years a product comes along

# Mhich changes your Mole perspective.

THIS REMARKABLE new disc drive gives users an amazing 21MB of space on each special floppy disc. The drive works by utilising an optical tracking system which finds space between the grooves on the disc, with the information being stored magnetically as on a standard floppy diskette.

THE DISCS are interchangeable so realistic, unlimited storage capacity is available for floppy disc drive users for the first time.

THE DRIVE is also capable of formatting

the normal double and high density discs to its own format so you can also utilise your existing discs. By using Morley Electronics own SCSI interface card and software the drive appears on the icon bar as a hard disc drive and can then be used to store data just as with a hard or floppy disc.

DATA can be copied to and from other drives just as you would normally and all of the usual RISC OS functions can be carried out.

WE BELIEVE that this drive represents the next step forward in data storage and are

offering the drive complete with our own SCSI interface card at the following prices.

Available for the A3000 and higher

External 21MB Mechanism £499.00
Internal 21MB Mechanism £425.00
Extra Floptical Disc £25.00
5 Floptical Discs £100.00

Please state computer type when ordering Mechanism prices include SCSI Interface card, software, all cables and case, manuals and one 21MB Floptical disc.

All major Credit Cards Accepted



Morley Electronics Ltd, Morley House, West Chirton, North Shields, Tyne & Wear. NE29 7TY

> Tel (091) 257 6355 Fax (091) 257 6373

#### THE COMPLETE

# DTP SYSTEM

Enter our tenth anniversary competition and win an Archimedes A5000-based desktop publishing system worth nearly £4000!

t's ten years since the first issue of Acorn User appeared. To celebrate our Lenth anniversary, we are offering readers the chance to win a complete desktop publishing system, which we have put together in conjunction with Acorn and Computer Concepts.

This top-class DTP system combines some of the best technology available in the world of desktop publishing, including:

- An Acorn Archimedes A5000 computer with colour multiscan monitor.
- A LaserDirect HiRes4 highresolution laser printer.
- A Scan-Light Professional flat bed image scanner.
- Impression 2 desktop publishing software.
- Artworks art and graphics software.

Using the high-specification A5000 computer and multiscan colour monitor, documents - such as company reports, newsletters, and so on - can be created quickly and using easily Computer Concepts' Impression 2 desktop publishing software.

Graphics can be created using CC's Artworks and images can be scanned and imported into your documents using the company's Scan-Light Professional scanner. They can then be printed out on a high-resolution Laser-Direct printer, CC's version of the Canon LBP4 laser printer.

This combination of hardware and software is not currently sold as a package although, if you wanted to buy



the items separately, the total cost would be just under £4000. An equivalent Apple Macintosh or IBM-PC DTP system could cost you at least twice that amount. But one lucky BBC Acorn User reader can win this superb Acorn system simply by entering our competition!

Also in celebration of our tenth birthday issue, we are giving away ten one-year subscriptions to BBC Acorn User, which include our free monthly discs packed with useful programs and utilities.

#### **HOW TO ENTER**

To enter the competition draw that will decide the winner of the DTP system, all you have to do is complete the reader questionnaire on pages 21 and 22 and include an idea for what you think might be a useful feature for our readers.

Apart from giving you the chance to win the DTP system, your answers will give us the information we need to provide you with an even better magazine. We want you to tell us about the features you like or dislike and what sort of things you would like to see more, or less, of. We would also like to find out more about you and your computing environment.

All completed questionnaires will be held in the strictest confidence and will only be used internally for planning future editorial.

To stand a chance of winning the DTP system, you should include your name and address and give us your suggestion for a feature which might be included in BBC Acorn User.

The closing date for receipt of the questionnaire is Monday July 27th 1992. The winner will be presented with the prize at the BBC Acorn User Show (Wembley Exhibition Centre, October 16-18).

Please return the questionnaire to: BBC Acorn User Reader Survey, Redwood Pub-20-26 lishing, Brunswick Place London N1 6DJ. (You may return a photocopied version if you wish). Only one entry per person please. The Editor's decision will be final. Usual competition rules apply.

Good luck!

#### THE COMPLETE DTP SET-UP

#### Acorn A5000 with multiscan monitor

The A5000 lies at the heart of our DTP system. It includes the Risc OS 3 operating system, a fast Arm3 processor, a standard 2Mb of memory and 40Mb hard disc. From the outside, the A5000 looks like a PC, but there the similarities end. When it comes to using the A5000, Risc OS applications are often more innovative and powerful, making use of the A5000's excellent graphics capabilities. As a DTP platform, the A5000 would be difficult to match in either price or specification.



#### LaserDirect HiRes 4

The LaserDirect HiRes 4 is the most popular in Computer Concepts' LaserDirect range of printers. It is built around the Canon LBP4 laser printer, offering four pages per minute at 300 or 600 dpi quality. The printer driver includes several unique features, such as a system for rendering outline fonts twice as fast as any other printer. It also 128 grey-levels, a choice of halftone screens, background printing,



and it can be used with other types of computers, such as PC compatibles.

#### ScanLight Professional

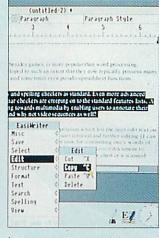
This top-of-the-range ScanLight model from Computer Concepts is



a high-quality, A4 flatbed scanner which can scan at up to 300dpi and 256 grey-levels. This produces scanned images of a quality suitable for typesetting. The ScanLight Professional has a SCSI interface and can be connected with an extended version of CC's ScanLight Plus software, which provides a wide range of manipulation options to enhance the scanned image, including fill control of the grey-map and edge sharpening routines.

#### Impression 2

Impression has become one of the most popular software packages in the Archimedes market, with over 15,000 copies sold so far. Produced



by Computer Concepts, it is an effective word and document processing package which can be used to produce any documents ranging

from newsletters to professional quality magazines (BBC Acorn User's editorial pages are produced using it). Impression 2 has received favourable reviews from leading magazines outside the Acorn marketplace, and has been compared favourably with some of the best DTP packages in the Apple Macintosh and IBM PC environments.

#### ArtWorks

Computer Concepts's new graphics illustration package, Artworks, has been designed along the lines of Adobe Illustrator for the Apple Macintosh or CorelDraw for IBM



PCs. Key features include: superfast editing and screen re-draw; comprehensive toolbox; 24-bit colour control using RGB, CMYK and HSV colour models; full process and spot colour control; linear and radial graduated fills; image distortion to an envelope; 3D perspective; infinite undo-previous step; rotated and graduated-filled text which remains editable on the page; display drawing as outlines or solid; layers; printer tiling; and full anti-aliasing of drawings.

#### Further information

If you want to find out more about desktop publishing, there are a couple of features in this issue which may be of interest.

For those who are experienced Impression users, our feature on page 26 will show you how to send your Impression documents to a professional printing bureau.

And, at the other end of the scale, if it is training that you are interested in, turn to page 31 for details of a training course which is suitable for newcomers to desktop publishing.



# READER SURVEY

#### **ABOUT YOU**

1 Are you: 01□ Male? 02□ Female?	(10)
2 What is your age group?	
01□ Under 16 02□ 16-24 03□ 25-34	(11)
04□ 35-44 05□ 45-54 06□ 55 or more	
3 What is your occupation?	
01□ Student at school 02□ Student at college/university 03□ Teacher/lecturer	(12)
04□ Research and development 05□ Self-employed small business	
06□ Health/welfare 07□ Media/creative 08□ Computing/electronics	
09□ Engineering 10□ Other professional	

#### **ABOUT YOUR COMPUTING**

12 Admin/clerical

13 Manual/tradesman 14 Uniformed services 15 Unemployed 16☐ Other (please specify)

#### 4 What micro(s) do you own or use regularly?

At	At	
home	work	
01□	02□ BBC Model B	(13)
01🗆	02□ Electron	(14)
01□	02□ Master128/Compact	(15)
01□	02□ Archimedes A5000	(16)
01□	02□ Archimedes 300 series	(17)
01□	02□ Archimedes 400 series	(18)
01□	02□ BBC A3000	(19)
01□	02□ Archimedes A540	(20)
01□	02□ Other	(21)

#### 5 Which of the following do you own or intend to buy in the next 12 months?

Own Intend to bu

Own	Intend to buy	
01🗆	02□ Disc drive	(22)
01🗆	02□ Hard disc	(23)
01🗆	02□ Dot matrix printer	(24)
01🗆	02□ Laser printer	(25)
01□	02□ Normal monitor	(26)
01□	02□ Multisync monitor	(27)
01🗆	02□ Mouse	(28)
01🗆	02□ Memory upgrade	(29)
01🗆	02□ Arm 3 board	(30)
01🗆	02□ Modem	(31)
01□	02□ Midi music equip.	(32)
01□	02□ PC Emulation board	(33)
01🗆	02□ Other (please specify)	(34)

#### 6 What do you mainly use your micro for? (You may tick more than one box)

triair one zon,	
01□ Programming	(35)
02□ Learning about computers	
03□ Computer games	
04□ School or college work	
05□ Teaching own children	
06□ Teaching at school or college	
07□ Home or personal affairs	
08□ Business	
09□ Club or society administration	
10□ Office work at home	

#### 7 What are the main applications you use your micro for? (You may tick more than one box)

~,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
01□ Accounting	(36
02□ Adventure games	
03□ Arcade games	
04□ Computer aided design (CAD)	
05□ Communications	
06□ Databases	
07□ Desktop publishing	
08□ Control/monitoring	
09□ Graphics/art/design	
10□ Home education	
11 Music	
12□ Research	
13□ Spreadsheets	
14□ Teaching	

15□ Your own programming	
16□ Word processing	
17□ Other (please specify)	(37-38)

#### 8 What disc system do you use? (Please tick as many as applicable)

01 5.25in 40 track (39)02 5.25in 80 track 03 3.5in (Master)

04 3.5in (BBC A3000/Archimedes)

#### 9 Where do you usually make your hardware and software purchases?

01□ High Street store		(40)
02□ Mail order		
03 Official Acorn dealer		
04□ Other (please specify)	- (	(41-42)

#### 10 Please estimate your personal software spending over the last/next 12 months

Last year	Next year	
01🗆	02□ Less than £20	(43)
01□	02□ £20-£49	(44)
01□	02□ £50-£99	(45)
01□	02□ £100-£299	(46)
01□	02□ £300-£499	(47)
01□	02□ Over £500	(48)

#### 11 Please estimate your personal hardware spending over the last/next 12 months

Last year	Next year ·	
01□	02□ £20-£49	(49)
01□	02□ £50-£99	(50)
01□	02 £100-£299	(51)
01□	02□ £300-£499	(52)
01□	02□ £500-£1000	(53)
01□	02□ £1000-plus	(54)

#### 12 Have you bought mail-order products from advertisements in BBC Acorn User?

01□ Never (55)02□ Occasionally 03□ Often



#### 13 Is your A3000/Archimedes 22 How often do you type in More Less About right Individual software reviews computer part of a network? the programs listed on the 010 020 (72)030 01□ With other A3000s/Archimedes (56) vellow pages? Software comparison reviews 02□ With other BBC micros 01□ Regularly (92)010 020 03 (73)03 With other micros (PCs, etc) 02□ Sometimes Hardware reviews 04□ Not networked 03□ Never 010 03 020 (74)Hardware comparison reviews 14 Are you responsible for 23 Would like to see software 010 020 030 (75)managing a network? Games product listings? 01□ Yes (57)010 020 03 (76)01□ Yes (93)02 No. Competitions 02 No 010 020 030 (77)15 Do you have responsibility Yellow pages program listings 24 Would you like to see 010 02 03 (78)for specifying/purchasing the hardware product listings? Puzzle page following at your workplace? 01□ Yes (94)010 (79)030 02□ No 01□ Computers (58)02□ Software 19 Overall, how do you rate 25 If a disc full of programs was 03 Peripherals BBC Acorn User's technical attached to the magazine, how content? ABOUT BBC ACORN USER much more would you be 01□ Too technical (80)prepared to pay for it? 16 How do you usually obtain 02□ Not technical enough 01 75p (95)02□ About right your copy of BBC Acorn User? 02 £1 01□ By subscription 03□ £1.50p 20 Would you like to see Acorn-02□ Regular newsagent's order 03□ No more 03□ Buy it every month related products compared with 04□ Buy it regularly 26 Which disc size would you those from IBM PC or Apple 05□ Read someone else's copy prefer to receive with the Macintosh environments? 17 How long have you been magazine? 01□ Regularly (81)01□ 5.25in reading BBC Acorn User? 02□ Sometimes (96)03□ Never 02 3.5in 01□ Less than three months (60)02□ 3-6 months 27 Do you own or use any 21 Which of the following do 03 7-12 months Computer Concepts' products? 04□ More than one year you buy regularly (at least one 05 More than two years 01□ Yes (97)out of two issues) or subscribe 06□ Since before 1984 02□ No to? (You may tick more than 18 Would you like to see more, Finally, to enter the draw to one box) or less, coverage of the win the complete DTP system, Buy Subscribe to 010 02□ BBC Acorn User (82)following (please tick please give us your idea for a 010 02 Micro User (83)appropriate box in each case) feature for BBC Acorn User. 010 02 Archimedes World (84)More Less About right 010 02□ Beebug (85)News 010 02□ Risc User (86)010 020 030 (61)02□ Archive 010 (87)Education 010 02□ Educational Computing 010 020 03 (62)(88)Graphics 010 02 Personal Computer World 020 03 (63)(89)Communications 010 02□ Computer Shopper (90)010 020 030 010 (64)02□ Other (please specify) (91) \*INFO 020 010 030 (65)Questions & Answers When you have completed this questionnaire, please send it to: 020 010 03 (66)BBC Acorn User Reader Survey, Redwood Publishing, 20-26 Brunswick Place, Readers' Letters London N1 6DJ. Entries should arrive no later than July 27 1992. 010 020 03 (67)Features for beginners 010 020 03 (68)Programming 010 030 (69)Technical advice

......Postcode.....



02

030

030

(70)

(71)

010

010

Networking

PRODUCED by The Fourth Dimension .... THE Acorn Games Specialists

## Saloon Cars DELUXE





#### The Improved Driving "Game-ulation"!



#### UPGRADE for ½ PRICE Only £17.50

This new improved DELUXE version of *Saloon Cars* includes many new features suitable for upgraded machines and A5000s, plus many new features suitable for all machines.....

#### REAR-VIEW MIRROR

Improved rear-view mirror.

Improved improved rear-view mirror suitable for Arm3 users.

#### COMPATIBILITY

Compatible with Course disc to be released soon (see below).

Compatible with Formula 1 upgrade to be released in response to demand for a decent Formula 1 simulation on the Archimedes (hopefully late 1992).

Compatible with Saved Players from Saloon Cars v1.0.

#### GRAPHICS

New car graphics, featuring the most sophisticated vector graphics ever seen in a home computer game, allowing full 3D rotations of cars - other cars can actually spin off the track in front of you. More realistic crashes, allowing other cars to have smash-ups almost as spectacular as your own (2MByte only).

Gameplay has been enhanced immeasurably by the addition of a completely new loading screen.

#### Gameplay has

New practice course (Test Track), easier (less hard) to stagger round than the old one.

Even more detailed and realistic features on most courses.

Detailed and Fast modes on some courses to allow use of the full potential of the Arm3 without compromising Arm2 users.

#### BORING TECHNICAL JARGON

Can be installed onto and run from Hard Disc.

Features minor refinements to the more anomalous features of the original Saloon Cars v1.0. (Most of the bugs have been fixed!).

of the bugs have been fixed.).

Unique integration process allowing speed variations in processing to maintain the highest possible frame rate at all times whilst maintaining perfect real time simulation of the race. (The game doesn't slow down when the graphics do!).

Special mode for machines with more memory which uses the extra capacity to enhance the speed and complexity of the graphics.

#### AND FINALLY

Many more features which we want to be a surprise.

Probably a few more features we haven't even thought of yet, and....a few we didn't think up at all.

#### OLD FEATURES

Saloon Cars DELUXE still...

does not provide a realistic simulation of a full time office job,

does not make the coffee,

and it still isn't quite as good as actually going out for a drive in a Sierra Cosworth.

#### OLD REVIEWS OF SALOON CARS v1.0

"Saloon Cars is the definitive racing game. It is pure, unadulterated fun." Archimedes World '91.

"Make no mistake: the speed and smoothness of this game has to be seen to believed." Syracuse '91.
"...you cannot help but be astounded at the gameplay." Club A3000 '91.

#### Acorn A3000, A5000 & Archimedes Price £34.95

To upgrade simply return the whole original *Saloon Cars* directly to us plus payment. We'll send you the newly packaged / enhanced 3 disc DELUXE version on release.



The new *DELUXE* version still contains the 2 real courses, Silverstone and Brands Hatch, plus a newly designed wide practice course called Test Track ideal for beginners.







#### SALOON CARS EXTRA COURSES

This new Course disc contains 3 superb new courses which are only compatible with the new DELUXE version. They cost £19.95 and will be released hopefully in late June '92.







SALOON

#### PRODUCED by The Fourth Dimension .... THE Acorn Games Specialists

### 1ess





#### "The Definitive Chess-Playing Program







Chess is probably the most popular game in human history. It has survived for fourteen centuries and is as successful today as ever. Thousands of people have dedicated their lives to its study and over ten thousand books have been published on its theory.

Now the Fourth Dimension is bringing the full magic of the game to Archimedes owners with its latest product, Cyber Chess. This represents one of the highest specification chess-playing programs available for any micro-computer. Over three sides of A4 paper is needed just to name the features present in the program. Some of its main points are:

#### SUPERB 3D SIMULATION

- A near complete 3D simulation of the game. Animation is used to move the pieces smoothly around the board; pieces are picked up and dragged by the human player to their new squares.
- Designed for total clarity. The board is carefully arranged so it can be played from without difficulty. A large alternative 2D view is also provided as an option.
- High-quality digitized stereo sound and speech.

#### RISC OS COMPLIANT

- Runs from the desktop in a window; fully multi-tasking and intuitive; follows the 3D style associated with high quality software.
- Multi-windowed. Any number of games can be opened and running from one incarnation of the program (within available memory). A sophisticated internal scheduling algorithm allows Cuber Chess to drive all computer opponents/games simultaneously whilst still smoothly multi-tasking with other desktop applications.

#### FIDE RULES

Full implementation of all applicable chess laws, including en passant captures, underpromotions, 50/75 move rule etc. Even resignation and draw by agreement are supported.

#### HIGH SPEC MACHINES

- Optimised for an ARM2, mode 12 system. But takes full advantage of a faster processor or even extra RAM to produce a higher 'full strength' playing standard and smoother animation.
- Thoroughly tested with RISC OS 3; supports saving of the desktop.

#### BACKGROUND

- The publisher, The Fourth Dimension, is the premiere specialist games house for the Archimedes with a string of classics dating back several years. Cyber Chess represents the latest in superb 3D simulations following on from great best-selling successes such as Chocks Away, Saloon Cars and Break 147 & Superpool.
- The author, William Tunstall-Pedoe, has been developing commercial software for Acorn machines for nearly ten years including several high-quality Archimedes products. He has a First Class Honours degree in Computer Science from Cambridge University and spent over a year studying computer chess research in order to produce Cyber Chess. This project is by far his most substantial yet and was designed from the beginning to be the definitive chess-playing program for RISC OS machines.

#### Acorn A3000, A5000 & Archimedes Price £49.95 Please ring for details regarding Site Licences The Fourth Dimension, 1 Percy Street, Sheffield, S3 8AU Tel. (0742) 700661 or 769950

#### SUPPORT FOR STRONGER PLAYERS

- State-of-the-art chess algorithm.
- Cyber Chess can perform analysis, giving the best line of play from the current position and an estimate of who is winning/losing and by how much.
- Full tournament time controls (e.g. "40 moves in 2 hours and then all remaining in 1 hour") can be set up. Time controls can be set for human players as well as computer opponents to simulate real tournament conditions.
- State-of-the-art opening book supports opening traps and advice. Multiple books are provided and new ones can be added or existing ones edited.
- Even the style of computer play (defensive, attacking etc.) can be adjusted to taste or to prepare for a match against a similar human opponent.

#### SUPPORT FOR BEGINNERS/CHILDREN

- You can learn chess from scratch using Cyber Chess with the tutorial supplied.
- 100 beginner levels are provided going from 0 (very very weak) to 99 (reasonably competent). This encourages beginners/school chess players to continue playing by not demoralising them and allows them'to monitor their progress as they begin to beat higher levels. When they beat level 99 they can graduate to 'full strength' mode.
- Teaching option shows you which moves are legal as you play.
- If a player gets stuck a hint can be requested.
- The names of the openings can be announced as they are played quickly familiarising chess learners with the various opening systems.

#### The Rourth Dimension HE Acorn Games Specialists

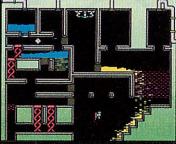
The following Fourth Dimension software is compatible with the Acorn A3000, A5000 and ALL Archimedes computers



Nevryon £19.95



Chocks Away £25,95 Extra Missions £19,95 Compendium £39,95





Black Angel £34.95 (Hopefully July) Can be installed onto Hard Disc



Break 147 & Superpool £34.95 Can now be installed onto Hard Disc



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# INTO PRINT

Impression can create DTP pages to a professional standard. But how do you get it from the screen to the printing press? Graham Bell shares some techniques

f you want more than about fifty copies of your document then printing it on even the fastest laser printer isn't the way to go. Many instant print' companies will duplicate or print your document, faster and cheaper than you could manage yourself.

Last month we looked at a number of techniques for preparing more professional documents: this month we'll complete the process with details of how to prepare your documents for a professional printer. Plus there's some more handy Impression hints, including a reliable way of producing dotted lines.

Most printers can work from camera-ready copy (CRC) and the best quality CRC is output on to bromide - a print of your document on photographic paper. Alternatively, printing plates can be made directly from film. A machine called an imagesetter is used to create both bromide and film: it works like a laser printer, but the laser beam writes directly on the photographic stock rather than using a drum and toner. Because of this, imagesetters work at far higher resolutions that laser printers - at least 1200dpi and often up to 2400dpi.

Modern imagesetters are usually Postscriptcapable. So in principle, they are no more difficult to use than a laser printer. But there are three areas where they differ from gardenvariety Postscript printers: the resolution is different, the paper or film size is different, and they usually have many more typefaces 'online'. The final problem is one of transferring your Postscript document to the imagesetter, since it isn't connected to your Archimedes like your printer. Companies which provide imagesetting services are known as bureaus.

#### STEP ONE: SENDING TO THE BUREAU

If your document goes on A4, and is limited to the standard Acorn outline fonts (Trinity, Homerton, Corpus, NewHall, Selwyn or Sidney) and any graphics stick strictly to black and white with no greys, then no special action is needed. All you have to do is create a Postscript version of your Impression document, put it on a disc and sent that to the bureau. In fact, this applies to any DTP document under Risc OS 2, not just Impression. If you have Risc OS 3, then the process is quite different and this will be covered in a separate article.

The first step is to check your document carefully. Print it out and read every word. This is your last chance to correct anything. Next load up the PrinterPS printer driver. Using the icon bar menu, set it to print to a file instead of the parallel or serial port: you need to type a

#### HOW TO MAKE RUNAROUNDS

One of the areas where Impression is found lacking is in its ability to control runarounds that is setting text around the irregular outline of an illustration. *Impression* can only run around frames: its frames either repel or they don't. The way to simulate this in Impression is first to make the main graphic frame non-repelling so that the text flows behind the illustration as shown in the first screenshot.

Then you add a number of repelling, transparent frames as shown below. These should 'cover' the area of the illustration in a mosaic-like fashion:. This technique can be applied both to Draw files and to sprites which appear to have an irregular outline. Though all

sprites are rectangular, a mask can be used to make parts of a sprite 'transparent', so you can mask off the unwanted background of a scanned photograph for example.

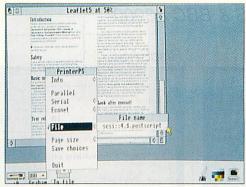
It can also be useful to group the mosaic frames together: then you can move the mosaic without having to move individual frames one by one. To group frames, click Select on the first, then Shift-Select the rest. Then choose Group frames from the Frame





filename into the menu box. Once it's set, print your document. This creates a file of type Postscript on your disc as shown in our first screenshot on p27.

This file can be copied on to a 720k PC disc: you can use PCDir from Norwich Careware, or Minerva's PC Access. The latter has the advantage of being able to format PC discs as well as reading and writing, but it does cost more. Take the disc and a final printout of the document to



Saving a Postscript file of your document

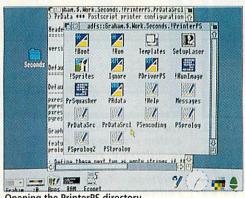
the bureau. Tell them it's a Postscript file on a PC disc: if the bureau has Macs (most do), then it can be read using Apple *File Exchange* or Dayna *Dos Mounter*, and sent to the imagesetter using Adobe *Font Downloader* or some similar utility. You should pay between £5 and £10 per A4 page for bromide or film output like this.

#### STEP TWO: SIZE AND RESOLUTION

If you have any greys, colours, sprites or non-Acorn typefaces, then this simple method will be disappointing. Odd typefaces will be substituted by Courier (Corpus) or Times (Trinity), and half-tones will be very coarse – the same as they are on a laser printer.

The solution to the problems of resolution and page size lie deep within *PrinterPS*. Double-clicking on the printer driver while holding down Shift opens the PrinterPS application directory as shown below. Within it are two vital files: PRdata and PSprologue. The former contains details of the Postscript printer itself, the latter handles the translations between Risc OS font names and Postscript typefaces.

PRdata is a condensed version of the PRdataSrc



Opening the PrinterPS directory

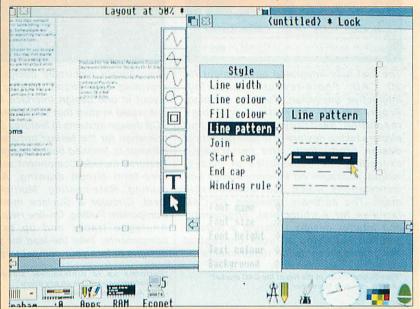
file. Load the Src file into *Edit*. There are two areas of the file which can be altered. The first is the 'Real printer definitions' near the head of the file. You can add your own definitions here, and they will appear as alternatives in the same way as you switch between mono and colour Postscript. We have provided you with several possible additions. The first addition (see the box on the right) gives details which could be added, for a typical imagesetter such as the Linotronic 300.

The second area for change is in the paper sizes. There are three already set up: A4, Letter and Legal. But even if you have an A3 laser printer, you can't utilise the whole paper area.

#### **DOTTED BORDERS**

To finish off the example six-panel leaflet we began last month, it needs a coupon requesting further information. And the coupon needs a dotted line to indicate where to tear it off. There is only one problem with this – *Impression* doesn't have a dotted frame border built-in. However, it does allow you to add your own borders with *Draw*.

Creating new borders is a tricky process, and your pattern can have odd side effects. But here's a reliable way to do a dotted border. First, fire up *Draw* – remember you can do this with *Impression* running. Draw a line 11mm long (use the 1×10cm grid as a guide). Now use the Style menu to choose its width – 0.5pt is quite thin – and set a dashed line pattern as shown in our screenshot. Don't make the line an exact number of dashes long, or it won't work properly: make sure neither end of the line ends with a gap between dashes.



Now go back to *Impression*, and on the Frame menu, choose the Border setup dialogue. Save the *Draw* file, and drag it onto the Borders target in the dialogue box. It will become border number 11 as shown above.

Finally, using the Alter frame dialogue, set border 11 on the edges of the frame you want in the usual way. You can now add a tiny frame with a " character (" in Selwyn font) to indicate where to cut out the coupon. If you use Fontdraw to turn the scissors character into an outline, it can be treated as a graphic and rotated into whatever position you want as a highly professional finishing touch.

rinter_name: Lino	tronic 300 (127	70 dpi)
rinter_number:	2	
xres:	1270	; dots per inch
yres:	1270	
oxres_halftone:	1270/8	
yres_halftone:	1270/8	
orinter_name:	Linotroni	c 300 (2540 dpi)
orinter_number:	3	
oxres:	2540	
oyres:	2540	
oxres_halftone:	2540/8	
oyres halftone:	2540/8	

Three new paper sizes can be added. A4Extra covers A4 documents with crop marks added as described last month – A3 and A3Extra are similar. These new paper sizes can replace the Letter, Legal and User sizes built into the PRdataSrc file.

The last line of each of the paper size definitions is Postscript program code responsible for setting the paper area. For the last two sizes, it also sets the halftone screen ruling – it effects the coarseness or fineness of any greys or sprites

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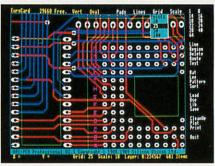
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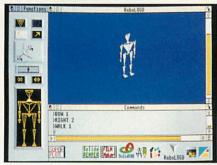


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#### RiscBASIC

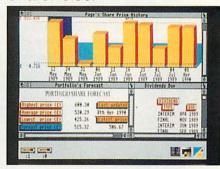


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in the printed result. A ruling of about 60 is typical for a laser printer. Newspapers are halftoned at about 75 or 100 lines per inch and magazines like Acorn User at between 133 and 150. Your printer should advise you what to use, depending on the printing method, the quality of the paper and so on. The A3 definition is left at the default resolution so it's suitable for A3 laser printers like the QMS PS-8810.

Unfortunately, the screen ruling has to be built into the paper size, so you can only have four combinations of paper size and screen (you could have four versions of A4, all with different half-tone resolutions). Take care when you type the Postscript in: Postscript is case-sensitive, it's all one line, and there are I (vertical bar) characters within it too.

You can easily alter the screen ruling if you want some other halftoning: you can even alter it on a normal A4 laser printer. The default is around 60 lines per inch, but you can increase it to perhaps as much as 80 or 100dpi. But while the apparent resolution of halftones increases, the number of grey levels goes down: the default has 32 grey levels, but at 100 screen there are only eight different greys. Because of the greater number of dots on a 1200dpi imagesetter, there are enough greys even at 125 screen, but finer rulings need a resolution of at least 2400 dpi.

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Experience  Finance and the address of address that were controlled to the address of the addres		ACT THE REPORT OF THE PARTY OF	County of the Act of the of the
,	alety	min to be particularly facility	VA.  The control department of the season of the control of the co
		PrinterPS	
SALOUR F	uk t	Info	Page size
		Parallel	Page type: R4Extra
	rut love!	Serial / Econet	Page height: 317.8 nm, width: 238.8 nm Graphics margins:
	200	File	Top: 8.8 nn, botton: 8.8 nn
3		Page size	Left: 0.8 nm, right: 8.8 nm
Save choices		Save choices	Text margins:
VE 9 8		Stop prints:	Top: 8 , botton: 8 lines
	11 -	fit - fi	Left: 8 , right: 8 chars

Changing the paper size to A4 extra

Save the new data file under a new name (perhaps PRdataSrc1). Next ensure you have PrinterPS on the icon bar. Then double-click on the PRsquasher program: this compacts the source file and creates a new PRdata which the printer driver uses. The input file can be called something like PDriver:PRdataSrc1, and the output file is PDriver:PRdata as shown in our next screenshot. Finally, Quit PrinterPS from the icon bar and re-load it ready for use.

The new printer definitions can be reached by clicking Select on the printer icon, then clicking on the printer name to cycle through the options: mono, colour and then any that you have added. The new paper sizes appear on the Page Size dialogue reached from the menu.

Once you have created your customised version of PrinterPS, you can use it to produce Postscript files to send to the bureau. It ensures that the page size is correct for your document even if it is larger than A4. One point to watch is printing wide pages. For instance, A3Extra cannot be used on common 303mm wide imagesetters, like the Linotronic 300. If in doubt it is always best to check the maximum output width with your bureau.

#### PAGE SIZES

This section from PrDataSrc is available on subscribers' disc or can be copied in. When typing in only press RETURN when you come to a paragraph character (1). Each page name is padded with semicolons so that page name plus semicolons is 80 characters long. The number of semicolons to type is in brackets. Do not type the text within in the brackets, or the brackets, simply type in the number of semicolons indicated.

page_number:	19
page_name:	A3 (default
screen)(tap the semi	colon key 61 times)
page_width:	0000842000¶
page_height:	0001191000¶
page_bottom:	P0000000000
page_top:	0001191000¶
page_left:	1P0000000000
page_right:	0000842000¶
text_top:	P0000000000
text_bottom:	P0000000000
text_left:	P0000000000
text_right:	P000000000
page_selection: %%I	BeginFeature: Page
Size A3lJstatusdict be	
setpageparams endl	

page_number:	2¶
page_name:	A4Extra (125
screen)(tap the semi	colon key 60 times)¶
page_width:	0000652000¶
page_height:	0000899000¶
page_bottom:	P0000000000
page_top:	0000899000¶
page_left:	P0000000000
page_right:	0000652000¶
text_top:	(P0000000000
text_bottom:	P0000000000
text_left:	[P0000000000]
text_right:	(P0000000000
page_selection: %%E	BeginFeature: Page
Size A4ExtralJstatusd	ict begin 652 899 0
1 setpageparamsend	J%%EndFeaturelJ
currentscreen 3 -1 rol	l pop 125 3 1 roll
setscreen¶	

page_number:	3¶	
page_name:	A3extra(150	
screen)(tap the semi	colon key 60times)¶	
page_width:	P000899000¶	
page_height:	0001248000¶	
page_bottom:	00000000001	
page_top:	0001248000¶	
page_left:	P0000000000	
page_right:	0000899000¶	
text_top:	1,00000000000	
text_bottom:	0000000000¶	
text_left:	0000000000¶	
text_right:	0000000000¶	
page_selection: %%BeginFeature: Page		
Size A3ExtralJstatusdict begin 899 1248 0		
1 setpageparamsendlJ%%EndFeaturelJ		
currentscreen 3 -1 roll pop 150 3 1 roll		
setscreen¶		

#### HINTS AND TIPS

 A cheaper alternative to using an imagesetter is to create cameraready copy on bromide or film. Buy a stock of very smooth, shiny paper such as 'Bromex gloss', available from graphic art shops or office stationers. You can also use a 600dpi laser printer, but be wary of any halftoned greys 'filling in'.



Squashing the data to make a new PRData file

#### STEP THREE: EXTRA FONTS

The PSprolog file within the PrinterPS application directory links the names of Risc OS typefaces with the equivalent Postscript faces. It's important to realise that not all Risc OS faces have Postscript equivalents - check with the type supplier if you're unsure, but in general you can rule out any of the more decorative and frivolous examples.

If you add a new typeface to your system, you cannot automatically print it out in Postscript. And unless the face is built into the printer, you can't print it at all! So for Risc OS 2 users, you're practically limited to the 35 faces included with most Postscript laser printers.

If you do add a new face, then there are a couple of changes to make to the PSprolog file. Type suppliers include instructions, but here's a summary. First load the PSprolog file into Edit. At the beginning is a list of all the typefaces on your machine. You need to add the Postscript name of each new face - typically there will be four weights when you purchase a package of typefaces, and the equivalent Postscript names will be listed in the documentation. As an example Beebug's Chaucer is equivalent to Postscript Zapf Chancery medium italic - for which the correct name is 'ZapfChancery-MediumItalic'. Add this at the beginning in exactly the same form as the existing list (two % signs, single spaces and so on). Be particularly careful with upper and lower case letters in these names.

The second addition to PSprolog is at the end of the file. Here is a list of Risc OS names, followed by their Postscript names again, and two Postscript commands. Once again copy the format of the existing entries carefully.

Making these changes allows you to prepare complex document files for output on to film or bromide at a bureau. For black and white work, these techniques are perfectly adequate - and in fact this very article was output using them.

#### PROFILE

Graham Bell is the Systems Manager for Redwood Publishing. He advises a number of well-known magazines, including BBC Acorn User, Good Food, Gardeners' World and Good Holidays, on their desktop publishing needs.



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# ON COURSE

Sarah Burns finds out how to become a DTP expert, courtesy of Minerva training

ontrary to popular belief, not everyone in the *BAU* office is a technical genius. Indeed, as the new editorial assistant, I was a complete novice to the Acorn world: my understanding stretched only as far as *Tetris*. And since *BAU* is produced using the DTP application, *Impression II*, being hopeless was something of a hindrance. So I, Sarah Burns, latest addition to the *BAU* team, was sent forth to Exeter, home of Minerva software, to set matters right and become brilliant.

My course was a day's training in *Impression II* although there are several other courses available. Groups are only ever as large as six and they are generally limited to four, so that each student receives a high level of personal assistance. Also a questionnaire, sent a few weeks before the course, ensures that you are grouped with people who are as competent (or incompetent) as yourself.

Training began at 9.30am and, with not a moment to lose, our instructor launched into the lesson. The introduction to *Impression*, I must admit, left me confused but it became more exciting as we moved on to editing a document and manipulating text. By using our new skills, we reproduced a Minerva advert and in the process learnt even more. Techniques such as importing and sizing graphics, creating frames, changing fonts and effects were brought into play. We made seven frames on one page and filled them with different text and graphics provided on a disc.

As the text was in small plain print, we altered the size and style as frivolously as we wished. The graphics were sized and rotated until they fitted into the frame. Finally a border was selected to frame the advert and finish our first masterpiece. Unbelievable but true, I was learning and enjoying myself.

Our instructor carefully guided us through each function and even covered the more obvious details, such as how to use the mouse and how to select and save text. To help matters along, an instruction book was supplied that covered the main points of the day.

Brainache and lunch arrived at the same time and after lunch it was heads down again. The afternoon session was dedicated to copying a Minerva news sheet. This killed at least 20 birds with one stone as we whizzed through designing and formatting master pages, editing the base style, rulers, other styles and available options, stopping only for one well-deserved tea break.

The news sheet was made up of four pages and we created the master page with a header, footer and page number. After lots of mouseclicking, the text flowed from one frame to another. For the advert we had used the Effect



Recreating this Impression newsletter is one of the tasks set by the course

menu to format the text. But this time we were introduced to the Styles menu. With this newfound magic button we changed the main heading and sub-heading.

I also changed most of the text for good measure, ignoring the recommended settings and ending up with a big mess. Ah well, you learn from your mistakes. Familiarising us with the new ruler option took some time but finally we aligned the text. The result, a complete newsletter page, can be seen above.

One day is not long to learn the wonders of *Impression* but most things were crammed in. As soon as a question entered my head it was answered, before I had a chance to speak: no one could accuse this instructor of skimping. The course was not, thankfully, too technical, although sometimes I found it hard to keep up.

Another bonus is that the training was very personal and the instructor tried to relate the application to our work. As the news sheet was particularly relevant to my job, the instructor emphasised how to copy text and paste it elsewhere on the page and checked that I understood how to alter frames.

In its brochure, Minerva claims that training gives greater operator efficiency and better motivation. And it's all true! The course taught me the basics of DTP and, by the end of the day, I had a disc of finished work and could confidently create documents for myself. After a few more handshakes and a certificate of achievement, I am now officially an expert!

#### **PRODUCT DETAILS**

Course: Impression II Price: £110 Company: Minerva Training Tel: (0392) 426160

Other courses: Minerva also offer a range of awareness courses, training for specific software packages, courses about Risc OS and customised training. All course fees include refreshments, lunch and course materials Length: Half – two days Price: £60 – £220

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# DIGITISE IT!

Enter our competition and win one of ten HCCS Vision Digitisers

he Vision Digitiser from HCCS is a real-time digitiser which allows BBC A3000 and Archimedes users to digitise and store video images from any PAL video source (TV, video, camcorder). It is both a simple and remarkably cheap product, costing only £49 plus VAT.

Now, in conjunction with HCCS, we are giving away ten Vision Digitisers in our easy-to-enter competition.

#### **VISION DIGITISER**

The Vision Digitiser card is a half-width podule with a single phono socket on the back panel for receiving the composite video signal, which is then digitised in monochrome and can be saved in the usual Risc OS manner.

The software supplied with the card includes the *Vision* application, which produces a desktop window showing the video signal, continually grabbed at a rate of about once a second. Brightness and contrast are controlled from software and the continuous image is displayed in a low resolution form for speed. When grabbed, this is converted to a higher quality 640×250, 256-grey scale sprite. Even from standard



Digit-eyes images from any PAL video source, such as a camcorder, with the Vision Digitiser

VHS videos, useful images are simple to grab.

The final sprite can then be saved to disc in the normal way and exported to applications for art, DTP, and so on. Although the images are saved in mono, you can enhance them with colour using other applications, such as *Paint*.

The quality of images produced, considering the constraints of the video source, is about as good as you are likely to get on the Archimedes. And for the money, the results are exceptional.

#### **HOW TO ENTER**

To stand a chance of winning one of ten Vision Digitisers, simply answer—the questions below, complete the tiebreaker and send to coupon (or a photocopy) to: Vision Digitiser competition, *BBC Acorn User*, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. The closing date for entries is Monday July 27th 1992. Usual rules apply.

sprite. Even from standard exceptional.	
	QUESTIONS 1. Which famous cartoon charact
103	2. Where is HCCS based?
60000000000000000000000000000000000000	Tie-breaker (please complete in r I would like to own a HCCS Visio

Cool dudes! But who is this digitised cartoon character?

VISION DIGITISER COMPETITION		
Please include your name and address details, answer both of the questions below and complete the tie-breaker		
Name		
Address		
Postcode		
QUESTIONS  1. Which famous cartoon character has been digitised on this page?		
2. Where is HCCS based?		
Tie-breaker (please complete in no more than 20 words) I would like to own a HCCS Vision Digitiser because		

#### Watford Electronics

(A member of the Jessa group of Companies - Established 1972)



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Tel: Watford (0923) 237774 Tlx: 8956095 Fax: (0923) 233642

Acorn

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The choice of Experience

#### Archimedes micro

System	Basic	Mono	Colour	Multiscan
A540/1	£2495	£2555	£2655	£2815
A3000	£599	£665	£759	£924
A3000L/C	£642	£708	£802	£967
A5000H/D	_	_	_	£1499
A5000L/C	-	-	-	£1531

#### Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro	Free Offer
A540/1	Multiscan monitor with VIDC enhance
	and LC20 Printer
A3000	2Mb RAM; Monitor plinth and Acorn's
	A3000 Shoulder Bag (carrying case)
A5000	Upgraded to 4Mb RAM
Plus of	course our no quibble 12 months EREE

On-Site Maintenance on all above Micros.

A5000 - 100Mb 18mS Hard Disc Upgrade	£269
A5000 - 210Mb 18mS Hard Disc Upgrade	£459

#### Archi Accessories

• 3.5" 800K 2nd Floppy Drive (305/310)	£118
• 5.25" 800K external Floppy Drive	£85
I/O Podule (Analogue/User/1MHz bus)	£79
I/O Podule (Analogue/User)	€49
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MIDI add-on to I/O Podule	£27
MIDI Expansion Card	£65
Econet Network Board	£42
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<ul> <li>Archi replacement mouse – New design</li> </ul>	£32
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Floating Point Unit	£455
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2 Podule Backplane	£20
4 Podule Backplane	£25
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Ethernet Card	£220
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<ul> <li>A5000 – 2 to 4Mb RAM Upgrade</li> </ul>	£92

A3000 Accessories	
• 3.5" External Drive£95 • Monitor Stand	£15
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A3000 Dust Cover £5	
A3000 plus Monitor Dust Cover	£
A3000 User Port/Midi Upgrade Card	€44
A3000 User/Analogue/IIC I/O Card	€42
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#### Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided. P.S. A310 upgrades require a backplane and a fan.

3HDP - Hard Disc Podule only	299
• 3HD20 - 20Meg H' Disc + Podule for 310	£195
• 3HD40 - 40Meg H' Disc + Podule for 310	£285
<ul> <li>3HD50 – 53Meg H' Disc + Podule for 310</li> </ul>	£359
<ul> <li>4HD20 – 20Meg Hard Disc for 410</li> </ul>	£96
<ul> <li>4HD40 – 40Meg Hard Disc for 410</li> </ul>	£195
<ul> <li>4HD50 – 53Meg Hard Disc for 410</li> </ul>	£260
<ul> <li>A3000 20Meg Hard Disc + Podule</li> </ul>	£279
A3000 40Meg Hard Disc + Podule	£379

For Low Cost, High Performance Archimedes IDE Hard Disc Drives, please turn to page 13

#### Archimedes A3000 Desk Top Publishing (DTP) Sale Offer

A3000 BBC Archimedes Micro with 3.5" Floppy Disc Drive and a mouse, upgraded to 2Mb RAM, COLOUR Monitor + Lead, 20Mb fast IDE Hard Disc Drive, 'Compression' Utility to increase the Hard Drive capacity to Typically 40Mb, The highly acclaimed Computer Concept's Impression Junior DTP software package.

RRP: £1299

#### Sale Offer Price: £875

Above Package plus Acorn's Learning Curve £892

DTP Package as above but with a NEW 30Mb fast IDE Drive, Williams sion utility, the capacity is increased £899 30Mb fast IDE Drive, (with Compresto typically 60Mb)

Above package with Acorn's Learning Curve £942

Special Education discounts available on above package, micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

(0923) 237774/250335

#### Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

<ul> <li>R300-4 Layer RAM upgrade board (Bare).</li> </ul>	
Requires 8 x 4MBit RAMs	£25
<ul> <li>■ R302-A3000 – to 2MB RAM Upgrade</li> </ul>	£36
<ul> <li>R303-A3000 – to 2MB RAM Upgrade</li> </ul>	
(expandable to 4MB)	£55
<ul> <li>■ R304-A3000 – to 4MB RAM Upgrade</li> </ul>	£125
R311-A305 – to 1MB RAM Upgrade	£30
<ul> <li>R312-A305/310 – to 2MB RAM Upgrade</li> </ul>	£149
<ul> <li>R314-A305/310 – to 4MB RAM Upgrade</li> </ul>	£205
<ul> <li>R412-A410/1 – to 2MB RAM Upgrade</li> </ul>	£30
<ul> <li>R413-A420/1 – to 4MB RAM Upgrade</li> </ul>	£60
<ul> <li>R414-A410/1 – to 4MB RAM Upgrade</li> </ul>	£90
<ul> <li>R810-A410/1 – to 8MB RAM Upgrade</li> </ul>	£579
<ul> <li>R820-A420/1 — to 8MB RAM Upgrade</li> </ul>	£549
<ul> <li>R840-A440/1 – to 8MB RAM Upgrade</li> </ul>	£479
R814-R140 – to 8MB RAM Upgrade	£499
<ul> <li>A5000 – to 2MB additional RAM Upgrade</li> </ul>	£92

0% Finance & Special Teachers/Academics' prices Now available on A3000L/C and A5000 L/C Micro Systems

#### Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

UP10 - to 2MB RAM + 20MB Hard Disc	£159
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SWIV	£19
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Tracker	£40

Turbo Driver BJ10E

WorldScape

Lease Purchase facility now available. Please telephone or write in for details.

# **Silicon Vision**

Gerber Plot	£95	Solids Render	£120
Solid CAD	£120	Solid Tools	£279
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Super Plot	£28	Data Vision	£110
Super Dump	£22	Share Holder	£135
Arc PCB Profes	sional		£275
Realtime Solids	Modeller		£136

## **Desk Top Publisher** Acorn's Archi DTP Package £108 £39 Equasor £125 Impression 2 DTP Pack Impression Junior £69 Impression Business Supplement £39 Impression II Borders Disc £19 **Expression-PS** Tempest DTP Package

# **Archi Wordprocessors**

Pendown Archi	£48	1st Word Plus - 2	£63
Pendown Outline		Archie Spell Master	£25
Fonts	£18	PD Spellchecker	£40
Wordwise + Disc	£24	Graphic Writer	£19
Image Writer	£25	EasiWord	£18
Interword Disc	£24		

# **Databases**

AlphaBase	£36	Magpie	€40
Flexifile	£79	Multistore v2.01	£176
Knowledge Organiser£42		Pinpoint	£65

# **Spreadsheets**

Intersheet Disc	£24	Schema	£89
Viewsheet	£45		

# **Business Graphics**

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

# Integrated Packages

Logistix	LIS	Fipeuream 4	214
- 5 11 011	D	0	

Desktop Office - Database, Graphs & Charts, Wordprocessor Spreadsheet, £98 Communications

Desktop Folio - Wordprocessor, Desktop & Interactive Publishing, Ideal for school £75

# A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example

- patures
  An 8 bit User Port with a standard 20 way IDC
  connector, compatible with the User Port on the BBC
  computers and the Archimedes I/O Podule.
  A 10 bit Analog to Digital Converter with a standard
  15 way D type connector, compatible with the ADC
  on the BBC range of computers and the Archimedes
  I/O podule.
- I/O podule.

  An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. £42

# Concept Keyboards

Standard A3 Keyboard with BBC Software	£138
Standard A4 Keyboard with BBC Software	£109
Archi A3 Keyboard	£139
Archi A4 Keyboard	£110

# Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes.

# Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers. Only £15 New RISC OS Version

# **Archimedes External Disc Drive Interface**

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead A300/A3000 £21 • A400

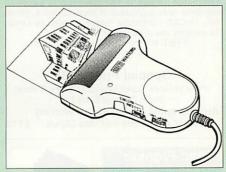
**More Archimedes Products** See Pages 3, 5, 6, 8, 10, 13

# **LANGUAGES (Archimedes)**

ISO-PASCAL; FOI	RTRAN	77 9	77 each
Assembler; LISP;	Prolog	X £1	49 each
ANSI C Rel. 3	£125	Logotron Logo	£45
Macro Assembler	£40	Risc Basic	£120
Robo Logo	£69	Risc FORTH	£110
BASIC Compiler	677		



# 256 Grey-Scale Scanner



Watford proudly introduces its new innovative 256 grey-level hand scanner for the Archimedes range of micros. It offers up to 400 dpi scanning resolution, complete with software. 256 Grey-Scale Scanner is ideal for incorporating pre-drawn logos, artwork, photographs and sketches into desktop publishing documents and other graphics programs. Designed by our own R & D team, it offers the best overall scanning solution for Archimedes micro. Just compare the competition on our price and these outstanding features:

- Full 105mm 400dpi scanning operation in just 3mS per line! (Twice as fast as most
- Selectable 256/16 grey levels
- Full scan preview, scale to fit windows
- · Complete set of image enhancement tools
- Single width podule
- True brightness and contrast control
- Fast RISC OS printing
- Over 1000 Image processing options; smoothing, enhancement, edge deletion, convolution, etc.
- Full Interface to ChangeFSI

**Launch Price** £185

# ULTIMUM - Archimedes A3000 **Podule Racking System**



THE ONLY LOGICAL WAY TO **EXPAND YOUR A3000 COMPUTER** 

Price: £149

# Minerva's Archimedes Software

EasyWord	£18	Mailshot*	£27
Home Accounts	£35	Reporter*	£27
Time Tabler	£549	School Admin*	£65
System Delta	€59		

System Delta Program Reference Manual Requires System Delta to operate

Stand alone Business Accounts Packages Sales; Purchase; Order Processing and Invoicing; Nominal; Stock management

£79 per module

or Complete Business Package £325

# ARM 3 Turbo Card Mkll Simply The Best



Here it is at last - the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £199. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

# Offer Price £169

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

Continued  $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$ 

# BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below)

# FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger. Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during June

# Add-Ons & Accessories

Econet Module for the Master	£42
Twin ROM Cartridge for Master	93
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Master Reference Manual II	(No VAT) £14
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Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	е
ARIES' IEEE Interface for BBC B &	Master £238
Morley Teletext Adaptor with ATS Ro	om £99
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# **Z88 Portable Micro**



£179

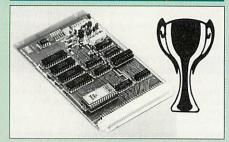
# FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

# **Z88 ACCESSORIES**

32K RAM Pack or 32K EPROM Pack	£10
• 128K RAM Pack or 128K EPROM Pack	£3
• 512K RAM Pack	£86
256K Eprom Pack	£5!
Z88 Eprom Eraser Unit	£38
Z88 Carrying Case	23
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	26
Z88 Serial Printer Cable	28
Z88 Parallel Printer Cable	£18
Z88 to Archi Link	£15
● Z88 to BBC Link £8 ● Z BASE	€56
● Z88 to PC Link II £27 ● Z TAPE	€42
● Z88 to Macintosh £32 ● Z TERM	€42
• Z88 Mains Adaptor £9 • Z88 Modem	£114

# Archi Real-Time Digitiser



# Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

# Price £119

A Set of Colour Filters for colour image grabbing £16

# Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers

& Art package)

# Special Price £165

(Price includes Tablet, Leads, Software & Puck) Stylus Optional Extra £15 Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus

# **Disc Plonker** Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and



£110

an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs

Protection at Only: £2

# Special Bulk Offer Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

# **BULK PACK DISCS in lots of 100**

	S/S	D/S	D/S
Туре	40T	40T	80T
Without Sleeves 5.25"	£28	£33	£38
With Sleeves 5.25"	£31	£36	£41
• 3.5" D/S D/D £27	7 for 50	£49 f	or 100

# Acorn & Watford DFSs

Wallord Sophisticated DFS HOW	2.10.00
Watford DFS Kit complete	£69.00
<ul> <li>We will exchange your existing ROM for</li> </ul>	
Watford's ultimate DFS ROM at only	£12.00
DFS Manual (comprehensive)	£6.95
Acorn DNFS ROM	£17.00
Acorn ADES ROM only	£25 00

€49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have replaced it with their more up-to-date 1772 DDFS Interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Acorn 1772 DFS ROM Kit

# Watford's MkII 1772

# Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus the added features as follows:

- Acorn ADFS compatible Use ADFS on our DDFS board.
- Auto 40-80 Track sensing no need to fuss with 40/80 track switches
- An extremely powerful 8271 emulation ensuring compatibility with almost all software.
- New low profile small footprint board.
- Option to double the speed of file handling operations - BPUT and BGET.
- Operates in both single and double density modes.

Complete Kit	Special Price £4	
DDFS Manual	(No VAT) £6.9	

· We will exchange your existing DFS Kit for our sophisticated DDFS for only



# 3M - Diskettes

3M - SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

• 10 x 5 25" S/S D/D 40T (744)

10 11 0120 010 010 101 (1111)	20
• 10 x 5.25" D/S D/D 40T (745)	£5
• 10 x 5.25" S/S D/D 80 Track (746)	£7
• 10 x 5.25" D/S D/D 80 Track (747)	£7
• 10 x 5.25" 1.6M D/S D/D High Density fo XT and AT	r IBM £9
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• 10 x 3.5" S/S D/D 40/80 Track	£7
• 10 x 3.5" D/S D/D 40/80 Track	£7
• 10 x 3.5" Double Sided High Density	£13



# Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

● 10 x M3 3.5" D/S D/D 80 Track	£7
• 10 x M9 3.5" D/S High Density	£12
● 10 x M4 5.25" S/S D/D 40 Track	£5
● 10 x M5 5.25" D/S D/D 40 Track	£5
● 10 x M7 5.25" D/S D/D 80 Track	£7
• 10 x M8 5.25" D/S H/D Hi-Density	£9
M2 3" Double Sided	£2.50 each

# Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted.

Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

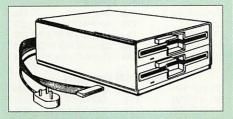
Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. Ideal for Schools & Colleges.

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

6th page of our advert for the Plinths).
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us

# "Test Bureau Approved for Use in Education"





# Our Disc Drives conform to BS415

Туре	Description	
	Disc Drive without	PSU
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£70
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£138
	Disc Drive with PS	U
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£80

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Twin, 40/80 track, 800K

**Double sided Drives** 

£149

• CD800S:

# 3.5" Disc Drive



These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	e Description	
	Disc Drive without PSU	
• CLS35:	Single Disc Drive, 400K	£59
• CLD35:	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
• CS35:	Single Disc Drive, 400K	£82
• CD35:	Twin Disc Drives, 800K	£126
(DO OOOF :-	and all and the activities again with a	

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

# Disc Drives in Monitor Stand



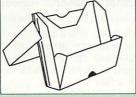
• CDPM 800S – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

# Plastic Library Cases



DLC1 -	Holds 5 x 3.5" Discs.	£1.50
DLC2 -	Holds 10 x 3.5" Discs.	£1.90
DLC3 -	Holds 5 x 5.25" Discs.	£1.60
DLC4 -	Holds 10 x 5.25" Discs.	£2.00

# **Disc Albums**

Attractively linished in leather-look PV	CVIIII
DW1 - Holds 6 x 3.5" Discs	£2.50
DW2 - Holds 6 x 5.25" Discs	£3.00
DW3 - Holds 20 x 5.25" Discs	£3.50
DW4 - Holds 40 x 3.5" Discs or	
5.25" Discs	£4.50

# Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

# Antistatic Lockable Disc Storage Units



Gives double protection – Strong plastic case that affords real protection to your discs.

Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

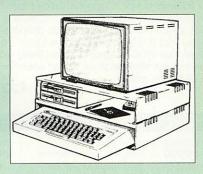
Dividers and adhesive title strips are supplied for efficient filing of discs.

•	M35	- holds up to 50 5.25" discs	£4.95
	M85	- holds up to 95 5.25" discs	£6.95
	M25*	- holds up to 25 3.5" discs	£4.95
	M50	- holds 50 3.5" discs	£6.50
	M100	- holds 100 3.5" discs	£6.99
	M10	- holds 8 of No. 10 Data Cartr	idges£15
		* No	t lockable

# **Dust Covers** (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

# Plinths for the BBC B, BBC Master & A3000



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

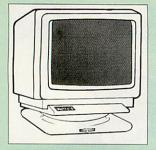
Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26

 A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Continued  $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$ 



# FREE Connecting lead with every monitor purchased from us. Please specify type required.

# Microvitec Monitors

• 1431 - Standard Resolution Monitor	£169
• 1451 - Medium Resolution Monitor	£209
Cub3000 Medium Res for A3000	£189
• 1441 - High Resolution Monitor	£359
Dust Cover for Microvitecs	£5.50
Touchtec 501 Touch Screen	£239
Now 3 years Parts & Labour warranty Microvitec Monitors	on all

# **Multiscan Colour**

<ul> <li>Eizo 9060S</li> </ul>	£389	• Taxan 770LR	£362
NEC 3FG	£370	• Taxan 775	£362
NEC 4FG	£465	• Taxan 795	£397
NEC 5FG	£850	• Taxan 875	£685
• NEC 6FG	£1525		
<ul> <li>VIDC Enhance</li> </ul>	er		£25

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)

# Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

# £325

COLUMN TO THE PROPERTY OF THE	
BM7502 12" Hi-res Green Monitor	£67
CM8833 14" Med. Res Colour Monitor	£167
Dust Cover for Philips Monitors	ee.

**Philips Monitors** 

# STAR BUY

• PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor. A pushbutton switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £166

# Spare Monitor Leads

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	25
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

# Aries 2000 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video output. All controls are located on the front panel for ease of use. Ideal for BBC, BBC Master, Archimedes and Amiga.

A bargain at £159

# **VIDC Enhancer**

This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to



multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software

MultiVideo VIDC Card: As above but for MultiScan monitors only.

# **Panasonic Printers**



	TOTAL CONTRACTOR OF THE PARTY O		The state of the s
• KX-P1123	£129	• KX-P1695	£272
• KX-P1124i	£173	• KX-P2624	*£295
• KX-P1170	£100	• KX-P2180C	£165
• KX-P1624	£272	• KX-P2123C	£219
• KX-P1654	*6335		

\* Price includes 12 months On-site warranty

# **Cut Sheet Feeders** P36 - 1124/24i £79 P37 - 1123/70/80 £69

P38 - P1624/95; P2624		£129
	Buffers	
D10	AV Duffer Doord for VV D1001	OFF

## P12 4K Buffer Board for KX-P1081 P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95 £16

# Serial Interfaces

P19 for P1123/24/24i/70/80/1624/54/95/2624 £49

# Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110	tor KX-P1081,	1592	2 & 159	5	26
P115	for KX-P1180	£7	P145	for KX-P1124	£7
P140	for KX-P1540	83	P155	for KX-P1624	83
Colou	r Ribbons for K	X-P1	081, 15	592 & 1595	
Brown	n, Blue or Red			£9 e	ach
P150	C Colour for P2	123/	2180		£15

# **Citizen Printers**

• 120D Plus	£100	Swift 24E#	£234
• 224	£185	Swift 24X	£299
● PN-48	£209	PN48 Ribbon	€4
• Swift 9	£134		

# FREE Colour Option with Swift 24E

+ FREE 2 years Parts and Labour warranty on all Citizen Printers

Swift 9 Colour Opt	ion	£19
Swift 24 Colour Or	otion	£29
Swift 24 Ribbons	Black £4	Colour £13
Citizen/Archimede	s Colour Printe	r Driver £15

# Integrex Colour Jet

£449
£6.50
£10
£21
£12.40
£55
£123
£POA

# Star Printers

		in the land of the	
• LC15	£173	SJ48 Inkjet	£174
• LC20	£100	• XB24-200 Colour	£295
• LC24-15	£240	• XB24-250 Colour	
• LC24-20	£169	XB24 Colour kit	£29
• LC24-200	£164	ZA200 Colour	£234
• LC24-200 Colou	r£203	• ZA250	£297
LC200 Colour	£143		
<ul> <li>Star/Archimedes</li> </ul>	Colou	r Printer Driver	£15

## **Cut Sheet Feeder** LC10/200/24-10 LC15/LC24-15 £65

XB24-15

£125

£52

	Serial Interfaces	
8K Ser	I C-200: I C24-200: FR10: FR15:	

£80

XB24-10

£25

# XB24-10; XB24-15

**Buffers** 32K Ram Card for LC/XB24-10; 15; LC200 £55

## Ribbons

£4: Colour £6
LT, COIOUI LO
£5; Colour £12
£5; Colour £12

# **Laser Printers**

## All Laser Printers include 12 months On-site maintenance

Brother HL-4	4ppm	£575
Brother HL4-V	4ppm	£675
Brother HL4-PS Postscript	4ppm	£1045
Brother HL8-V	8ppm	£995
Canon LBP4LITE	4ppm	£529
Canon LBP4+ 1.5M RAM	4ppm	£685
Canon LBP-8 III	8ppm	£970
Canon LBP-8III Plus	8ppm	£965
Epson EPL4100	6ppm	£550
Epson EPL7500	6ppm	£1150
Epson EPL8100	10ppm	£965
HP Laserjet IIP+	4ppm	£549
HP Laserjet III	8ppm	£1015
HP Laserjet IIID	8ppm	£1499
HP Laserjet IIIP	4ppm	£705
HP Laserjet IIIsi	16ppm	£2525
NEC Silentwriter S62P P/script	6ppm	£1089
NEC Silentwriter 266	8ppm	£675
NEC Silentwriter 290P P/script	8ppm	£1389
Panasonic KX-P4420	8ppm*	£620
Panasonic KX-P4450i*	11ppm*	£925
Panasonic KX-4455 Postscript	11ppm*	£1450
Panasonic KX-P4430 Satin Prin	t*	£685
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£910
Star LP-8 Star(post)script	8ppm	£1140
Star LP-4	4ppm	£565
Star LP-4 Mk 3	4ppm	£659
Star LP-4PS Postscript	4ppm	£779
* Now with 2 years On-s	ite warranty	

## **Laser Toners** Canon 2, 3 & 4 Star LP-8 £46 £56 Epson GQ KX-P4420/50 £19 **EPL 4100** Laserjet HP IIP & IIIP £42 £59 EPL7100 £82 Laserjet II/D, III/D £48 EPL7500 699 Qume Crystal (3)

Lase	er RAM	Upgrades	
IIP; III/P 1Mb	£51	EPL7100 256K	£39
IIP; III/P 2Mb	£88	GQ5000 512K	£42
IIP; III/P 4Mb	£135	KX4420/50 1M	£75
II & IID 1Mb	£64	KX4420/50 2M	£115
II & IID 2Mb	£99	KX4420/50 4M	£195
II & IID 4Mb	£146	Star LP8 1M	£139
Canon LBP4 1M	£105	Star LP8 2M	£275
Canon I RPR 2M	C125		

Laser Drum & Developer					
<ul> <li>Epson Drum</li> </ul>	GQ5000	£93	EPL7100	£129	
<ul> <li>Panasonic 4420</li> </ul>	Drum	260	Developer	£59	
<ul> <li>Panasonic 4450</li> </ul>	Drum	£93	Developer	280	
Qume Drum		£76	Developer	£56	

# latnage Postsorint Cartridge

uetpat	Je rusisi	stipt Cartifug	6
HP IIP/III	£225	IID & IIID	£227

	Various Add-Ons	
•	Laserjet Appletalk Interface	£13
•	HP Adobe Postscript	£39
•	Pacific Page Postscript	£25
	HP Premier Font Collection	£21
	Laserjet various Font cartridges	from £4

# **Hewlett-Packard Printers**

Desk let 500 F285 Paintiet XL 300

Desk Jet 500 Col.	£449	*Quiet Jet Plus	£415
*Paint Jet Colour	£525	*HP Think Jet	£265
*Paintjet XL	£1225		
# 3 years extended	Parts &	Labour warranty	£4
* Price includes 12	months o	on-site warranty	

• DeskJet 500 Cart. Black £15; Colour • Paintjet Cartridges Black £19; Colour £23 Desk Jet 500 256K RAM cartridge 599 HP Epson FX Emulation Cartridge for Desk Jet £59 £21 DJ 500 High Capacity Black Cartridge

Plug in Font Cartridges for DJ 500	
• 22706B - Prestige, Elite, Line Draw fonts	£55
• 22706C Letter Gothic & HP Line Draw fonts	£56
22707P - Proprint Emulation Cartridge	£57
Desk Jet Unlimited (Book No VAT)	£19.75

# **Canon Bubblejet Printers**

			D'ble	Ink
	Printer	CSF	Bin	Cart
BJ10EX	£183	£43	-	£16
BJ20	£265	_	_	-
BJ300*	£289	£88	£65	£12
BJ330*	£380	£110	£79	£12
BJC800C	£1525		-	-
• Spare B	Battery pac	k for BJ10E	Secretal A	£33
• BJ10EX	< - Archi T	urbo Driver		£42

# **NEC Pinwriter Printers**

• P20	£180	• P70	£419
• P30	£240	• P90	£635
• P60	£325		

 P60/70 Colour Option Kit Ribbons Black for P20/30 £6 for P60/70/90 • Ribbons for P60/70/90 Black £9 Colour £13.50

**Cut Sheet Feeders** 

P20 £59; P30 £85; P60 £89; P70/90 £80

# **Epson Printers**

£1079	LQ1060 Colour	£595
£1960	LQ1070	£313
£264	LQ1170	£435
£336	LQ2550+	£675
£159	LX400	£101
£162	LX850+	£140
£165	LX1050	£206
£205	SQ850	£432
£444	SQ1170	£589
£362	SQ2550	£625
	£1960 £264 £336 £159 £162 £165 £205 £444	£1960 LQ1070 £264 LQ1170 £336 LQ2550+ £159 LX400 £162 LX850+ £165 LX1050 £205 SQ850 £444 SQ1170

LQ860 Colour	£444	SQ1170	£589
LQ870	£362	SQ2550	£625
Cut	Sheet	Feeders for	
LQ570, LQ870	)		£47
LX400/850/LC	200/400	/450/500/550	
	LQ10	10/1070/1170	£72
LX1050 £	115	FX850/LQ860	£128
FX1050/LQ10	60/SQ8	50	£155
		SO2550	£210

# **Tractor Feed for**

LQ800 £44; LQ850/FX850 £69; LQ1050/ FX1050 £85; LQ2500 £90; LQ2550 £90.

# Accessories

EX800/1000 Colour Option	£45
EX800/1000 Colour Ribbon	£14
LQ2500 Colour Option	£65
Multifont Card for LQ550/850/1050	£95

# **Epson Printer Interfaces**

RS232 + 2K Buffer £52 **BS232** £28

Fillitei Leaus	
BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	26
IBM/Archimedes Parallel Lead 6'	£4
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	29
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

# **Fujitsu Printers**

B-100	£205	DL1100 Col	£26/
B-200	£299	DL1200	£363
DL-900	£181	DL3600	£508
DL1100	£217	VM800	£1036
	Ribl	oons	
DI 000/4400/4000	NA.	one CE	Col C11

L900/1100/1200 26 Col. £12 Mono DL3600 B-100/200 Ink Cartridge

# **Plotters**

• HP7440AU	£925	• HP7475AU	£925
	Roland	Plotters	
• DXY1100	£490	• DXY1200	£620
• DXY1300	€825	• DXY2500	£2345
• DXY3500	£2955	<ul> <li>Sketchmate</li> </ul>	£310
Roland plotte	r Pens Fil	re tin	£7.50

# Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
• 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£21
• 1,000 Sheets 15" x 11" Fanfold Paper	29
• 2,000 Sheets 15" x 11" Fanfold Paper	£16
• 1,000 Sheets true A4 Fanfold Paper 70gms	£11
• 2,000 Sheets true A4 Fanfold Paper 70gms	£21
Tolonrinter Poll (Econo paper)	64

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

# Printer Labels

# (On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

# Laser Printer Labels on A4 Sheets

3750 70 x 29mm (3 Rows)	£15.50
3000 70 x 37mm (3 Rows)	£15.25
2625 70 x 42mm (3 Rows)	£15.00

# **Printer Ribbons &** Various Dust Covers

Type	Ribbons	<b>Dust Cover</b>
BBC Micro	_	£3.50
BBC Master	Fig.	£4.00
Archimedes Micro pair		29.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	_
FX/MX/RX100/1000	£3.95	-
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	26.00
LQ1050/LQ2500	£4.00	-
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	25.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	25.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	26.00
Olivetti Ink Jet		
Cartridges (set of 4)	56	

# Professional Printer Stand



printer stand takes printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is

printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

> 80 Column version £24 (carr. £3) 132 Column version £29(carr. £4)

# Universal **Printer Sharers/Changer**

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch

## Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

	rolessional Typ	
Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38
Cal	bles extra at £6 e	each

# 2 Way Compact Printer Switch

A handy 2 way printer switch can be attached to the micro or monitor for ease of use.

• Centronics £18; • Serial £17 (Cables extra at £6 each)

# **Auto Printer Sharer Switch**

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1		289

# 256k Multi Spooler

These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 4 In/2 out £169 2 ln/2 out £135 8 ln/1 out £199

# **Compact Converter Units**

£36 Parallel to Serial £37 Serial to Parallel

# Laser Direct

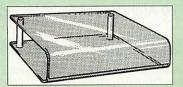


 Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers £315

 LPB 4 Printer plus High Res Card £875

LPB 8III Printer plus High Res Card £1275

# Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version 136 Column version £16 (carr £3) £20 (carr £4)



Quest Mouse III & Quest Paint	£59
Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont	£89
Quest Mouse III only	£30
Quest Paint Software only	£34
Quest Font Disc (22 Text Fonts)	£15
Quest Mouse Mat (Red or Blue or Green please specify)	£3
Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour	

Printer (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

£18



Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £30 (Price includes software in ROM and a

comprehensive Manual).
(Not Compatible with BBC Compact)

# Quest - Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £25 QT-20 Archimedes Version £26

# Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose

# Mk II Light Pen

Ideal for BBC B and Master. Price includes software on disc and operating manual £17

# Mk III AMX MOUSE

• AMX Mouse plus Super Art £54

(Please specify for BBC, Master or Compact)

• AMX MOUSE ONLY £29
• AMX SUPERART Package £29

AMX STOP PRESS – A Desktop
 publishing software. Works with
 Keyboard, Joystick or a mouse
 £25

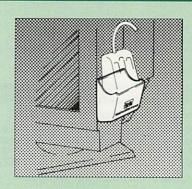
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker

£25

• AMX DESIGN (ROM) £34
• AMX XAM Educational £15

• AMX EXTRA EXTRA £16
• MOUSE MAT £3

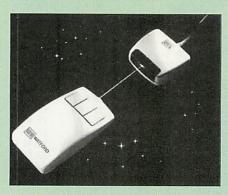
# **WE Mouse House**



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

# **Archi Cordless Mouse**



# Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- · High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £59

# BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

# £99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

# **Beeb Hand Scanner**

Hand-held Scanner for the BBC Micro



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware



Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

# The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

# Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

# **Word-Processor**

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

# The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individully proportionally spaced and characters of any size up to 16 x 16 pixels may be defined. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

wapping Editor Software Pack £59

Wapping Editor plus Mouse £79 (Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

# **Wapping Art Disc**

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

# Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

# Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

# Archi A4 Scanner



This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the IHELP application on the Acorn applications discs. The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

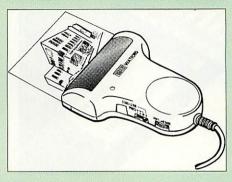
# New Low Prices:

Archi A4 Scanner	£269
Sheet Feeder for above	£75
Scanner + Sheet Feeder	£359

# Computer Concept Scanlight

Scan-Light A4	£275
<ul> <li>Scan-Light A4 + Sheet Feeder</li> </ul>	£368
Scan-Light Junior mono	£130
Scan-Light Junior 256	£197

# Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £119. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

# **SCANNER**

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

# **SCANNER SOFTWARE**

Full use is made of the windowing and the multitasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are.

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting. X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

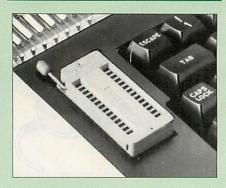
Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version £119
AHS-3 Archi A3000 Version £129

Continued  $\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$ 

# Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- · Very simple to install. NO SOLDERING required. The ZIF eliminates the possibility of damage to your ROM pins when inserting & extracting
- · The low profile of the socket allows unrestricted access to the Keyboard.
- We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- . BBC, B and B+ compatible.

£18

# **ROM Cartridges for the BBC Master**

Will also accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin £8; Quad £13

# **User Port Splitter Unit**



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

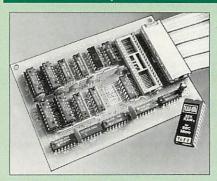
Excellent Value at £22

# Aries B-488 **IEEE-488 Interface Unit**

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238

# 32K Shadow RAM/Printer **Buffer Card Expansion Board**



## A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- While word processing, you don't wait for a slow printer, type in text while printing and save on expensive printer buffers.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free - 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

# Only £54

(Price includes a comprehensive manual and the ROM)

ARIES B-32 Shadow RAM Card

# Commander Joystick



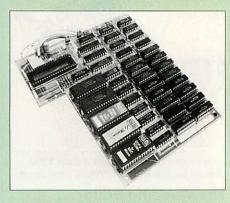
Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

# ROM/RAM Card



- NO SOLDERING required to fit the board.
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM.
- Separate RAM write register (&FF30 to &FF3F). Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

	PRICES.	
•	ROM/RAM card with 32k DRAM	£42
•	ROM/RAM card with 64k DRAM	£54
•	ROM/RAM card with a massive 128k	
	DRAM	689

# **OPTIONAL EXTRAS:**

FR 16k plug-in Static RAM kit 16k DRAM for Upgrade £13 Battery backup £3 Read and Write protect switches £2 each Complete ROM-RAM card with all options £109

# Voltmace Joysticks

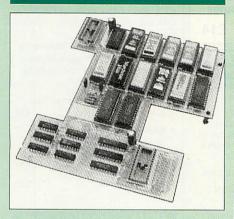
£10 **Delta 3B Single Joystick** £15 Delta 3B Twin Joysticks Delta 3C Joystick for Compact Delta 14B Single Joystick £10 £11 Delta 14B/1 Adaptor Module £12 Transfer Software Disc-Tape £7 Delta-Cat A mouse eliminator Joystick for the Archimedes €24

# **Delta Base B**



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

# Solderless Sideways ROM **Socket Board**



The key features of this no fuss, easy to install card

- Increases your BBC Micro's ROM capacity from 4 to 16.
- No soldering required.
- Very low power consumption.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- · Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35 Battery Backup fitted £39 Battery Backup only £3 16K Sideways RAM £8

 Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

# **BBC Educational Software**

•	Maths with a Story 1 (Disc). 4 primary i	evel
	maths programs	£20.00
•	Maths with a Story 2 (Disc). 4 further	
	maths programs.	£20.00
•	Picture Craft (Disc) 6-14 age group. Pa	ck

consists of flexible geometrical design & colouring programs. £17.00 POLYMERS O-Level program. £20.00

Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified

according to your own rule.	£20.00
ADVANCED TELETEXT SYSTEM	£8.65
PERIOD TABLE SOFTWARE	£20.00
Computers at Work – Primary	£17.35
Electric Fields 6-14 years	£11.25
Espana Viva – 3 Discs	£19.95
WHITE KNIGHT Chess game	£16.00
A Vous La France	£29.00
FUN SCHOOL 2 - Red: Under 6 yrs	£12.00
FUN SCHOOL 2 - Green: 6-8 yrs	£12.25
FUN SCHOOL 2 - Blue: 8 yrs+.	£12.50
FUN SCHOOL 3 – Red	£18.50
FUN SCHOOL 3 – Green	£18.50
FUN SCHOOL 3 – Blue	£18.50
- 0	

 Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+ £26

 More French Games – Another 6 games 12 years+ £26 Au Restaurant and Accident de Route

12 years+ Boulogne and Oh-Les - 2 programs for beginners

Letters to French Penpals – 11 years+

 French Programs with Henri Beret – The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16 £22

Six German Games - Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+

More German Games - Aimed at pupils in their 2nd year of learning German, 12 years+

An Introduction to Electronics - Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years

Computer Control - This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years £26

PUNCMAN Learning punctuation Puncman 1 & 2 for 7 - 13 years €15 Puncman 3 & 4 for 8 - 14 years £15 Puncman 5 & 6 for 8 - 15 years £15

Yes Chancellor - A chance to take over number 11 at Downing Street. 12 years+

Letters & Pictures - Introduces phonic skills to Infants 6-8 years £15

 Numbers & Pictures – Early number learning is a great fun (4-6 years)

Note Invaders - Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults)

Maps & landscapes No. 1 (9-14 years) £18

Help Your Child learn Basic Map work No. 2 (9-14 years) £18

Pirate - Educational Adventure (8-14 years) £15 Spelling Week by Week (6-14 years)

# Archimedes Software

9	Animated Alphat	pet	•	Glimpse Clip Art	
	(3-6 yrs)	£21		Utility (7-16 yrs)	£
•	Arcventure		•	Highlighter	
	(8-12 yrs)	£29		(6-16 yrs)	£4
•	Bookbinder	£43	•	Jiglet	£2
•	Bumper Disc	£14	•	Jigsaw	£2
•	Bumper Disc 2	£14	•	Mapventure	
•	Craftshop 1	£26		(9-13 yrs)	£2
•	Craftshop 2	£26	•	Microbugs	£2
,	Converta-Key	£16	•	Money Matters	£1
•	Data Word	£16	•	Nature Park Adv	en-
,	Desktop Stories	£35		ture (7-9 yrs)	£2
	DigiSim	£35	•	Numerator	£6
	Dream Time	200	•	Picture Book	£1
		£23	•	Recall (6-13 yrs)	£3
3	(5-7 yrs)		•	Sellardore Tales	£2
•		£19		Snippet	£2
•	Farm (5-7 yrs)	£19		Space Mission	

Fleet Street Phantom (9-13 yrs) £25 Fun School 2A Red (9-13 yrs)

(up to 6 years) £12 Fun School 2A Green (6-8 years)£14

 Fun School 2A Blue (8 years +) £14

£26

£26

 Gate Array Teaching System 968

2 8

8

 Space Mission Mada (9-13 yrs) Sting of the Dump

£22

£16

£25

 Target Maths Viewpoints

(9-12 yrs) £33 Wizard's Revenge (7-10 yrs) £17

 Worst Witch (7-10 yrs)

# **Connecting Leads**

(All ready made and tested) CASSETTE LEADS 7 pin DIN Plug to 3 pin DIN Plug + 1 Jack Plug £2.50 to 7 pin DIN Plug £3.00 to 3 Jack Plugs £2.50 6 pin DIN to 6 pin DIN Plug (RGB) £3.00

# Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single £3.00; Dual £3.75

# **Disc Drive Interface Leads**

BBC to Disc Drives Ribbon Cable Single £4 Twin £6

# **Miscellaneous Connectors**

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

# Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK

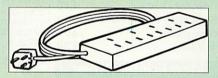
£8

# Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching

Protection for only £8.50

# 4 Way Mains **Distribution Socket**



4 way top quality mains trailing sockets Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required Very useful for tidying up all the mains leads from your peripherals.

£9.50

# Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£6.95

# 28pin DIL Header Plug

SOLDER type £1.50 IDC CRIMP type £1.95

# 8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only £1.00

28 pin ZIF SOCKET (Textool)

# Computer Concept's ROMS

Disc Doctor £18 £49 Inter BASE Inter CHART £25 Inter SHEET £37 Inter WORD £36 Mega-3 ROM £76 Spell Master £42

# Wordwise plus

£40

We are giving away absolutely FREE, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

# Word-Rid

This advance utilities ROM extends the power of your Wordwise plus ROM

- · Alphabetical sorting of names and
- Text transfer options. Chapter marker.
- Epson printer codes function key

- option.
  Search and display in preview mode.
  Embedded command removal.
  Print Multiple copies of a document.
  Multiple file options for print and
- preview. Address finder.
- Label printer.
- Mail-merger. Number/delete/renumber.

Clear test-segment area. BBC B, B+ and Master compatible.

Only £24

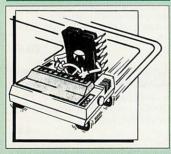
(N.B. Word Aid requires a Disc interface in your Micro)

# **Acorn ROMS**

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore \	£36
Viewspell - 80T disc	£25
Viewplot Disc	£20
(Please specify for Master 128 or 0	Compact)

View-Index £12 Hi-View £38

# View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

# Mini Office 2 - Disc

for BBC B & B+	£12
for BBC Master	£14
for BBC Compact	£16
	NAME OF THE OWNER OF THE OWNER.

(When ordering please specify for which Micro & 40 or 80T Disc)

# Assorted ROMS



ACORN ADFS ACORN BASIC 2 plus User Guide £22 Acorn BCPL ACORN DNFS £42 £17 Acorn FORTH Acorn Graphics Acornsoft C Disc £25 Acorn LISP Acorn OS B+ Acorn OS 1.2 Basic Editor €14 £22 Communicator 949 Dump Out 3 Graphics Extension Rom GXR-B £22 GXR-R+ Logotron LOGO MASTER OS ROM Master ULA (47) Master ULA (60) £38 £15 Micro Prolog £25 Microtext Disc £46 £199 Microtext Rom Numerator - Archi Numerator - BBC £69 639 Pendown ROM £32 Rom Manager SERIAL ULA TFD £35 Termulator B, B+ Termulator Master Video ULA 1Mb OS ROM £14 £39

## CHIP SHOP 1 MB-10 DIL D-RAM £4.50 1 MB ZIF D-RAM

256K x 4-8 DIP	€4.75
256K x 4-8 ZIF	€4.00
SIMs and SIPs	
256 x 9-8	£11
1Mb x 9-10	£26
1Mb x 9-8	£39
DS3691	£4.50
DS88LS120	£5.25
LM324	€0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£3.00
27128A-250n (12V5)	£2.50
27128-250nS (21V)	€4.00
27256-2	£3.00
27512-2	£4.50
27C101G (1 Meg)	£7.00
4013	75p
4020	£1.00
4164-10	£1.55
4464-10	£3.50
4816 RAM	£2.00
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'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £12.95 (No VAT)

# The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material. Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc, and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work - even giving advice on writing and marketing your own programs.

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This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included.

Price £5.95 (No VAT)
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(Now reads Archimedes Discs)

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This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

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Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application

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By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

## Hardware

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- Single width EuroCard
  Supports proposed ANSI ATA (IDE) specification
  Fast 16 bit MEMC interface interrupt driven to
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- 37 way D type socket for external drives
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AAA 0300 External Case & PSU for A3000 685

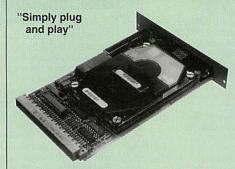
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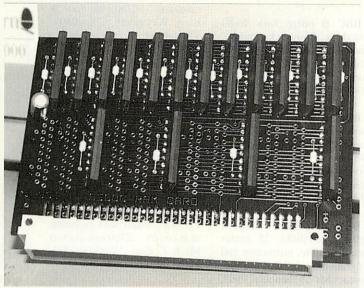


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Quality software and peripherals for the Archimedes series

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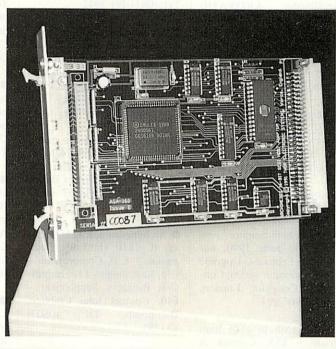
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- A3000, 1Mb to 4Mb Ram upgrade £85. Contact A Bradbury, Stoke-on-Trent. Tel: (0782) 314053 after 7.30pm weekdays
- BBC Master 128, RGB colour monitor, Epson printer, Twin 40/80 track drives, software on Rom and disc, joystick, mouse, games etc £600 ono. Contact Mrs P Dye, Southampton. Tel: (0703) 893243
- 5.25in 40/80T disc drive and interface for A300/A400 £75, serial port joystick interface and joystick £30, Euclid £25, Genesis Plus £30, Lemmings £10, Pacmania £10, Cartoon Line £10. Contact Mr D Locke, London. Tel: 071-416 7770 ext 448
- ◆ Archimedes A3000 2Mb Ram computer, Acom colour monitor, 1st Word, PC Emulator, Lemmings, Pacmania, Zarch, Hangman etc. Still 2 months warranty £670. Contact Makhan Rai, Derby. Tel: (0332) 281540

- Teletex adapter for Electron Plus One with manual £70, P/Pack, Master Break for Arc 3.5in disc £10. Contact M Surendra, Middlesex. Tel: 081-903 0904
- Master 128, single 40/80 DSDD drive, Amber monitor, teletext adapter, Pascal and utilities cartridges, all the manuals, loads of software £400 fully boxed, VGC. Contact Mark Lancaster, Cheshire. Tel: (061) 491 3942
- Archimedes A5000 computer, 40Mb hard disc, 2Mb Ram with free software. Brand new, unused unwanted present cost £1761. Will accept £1650. Contact Roger, Worsley. Tel: (061) 499 9845 evenings
- Wanted: Archimedes games especially Manchester United, Jahangir Khan's squash and Slappit. Contact James Baker, Ealing. Tel: 081-567 4643 after 7pm
- Archimedes software, Hearsay II £50, Hard disc Companion £30, Compression £35, Lemmings £18, Impression Business Supplement £40. Contact John Crabtree, Dartmouth. Tel: (0803) 833755
- The Electron User Group! For details send S.A.E. to: Will Watts, E.U.G.,134 Great Knightleys, Basildon, Essex SS15 5HQ
- BBC B, Interword, 40/80 Cumana disc drive, Business quality green monitor, Epson MX100 printer, manuals, books and discs £200. Contact Mr R York, Buxton. Tel: (0298) 70768

- Ovation version 1.25S original discs and manuals £80. Contact Keith, Sunbury. Tel: (0932) 788322
- BBC B micro with 40/80 disc drive, 2 joysticks, mouse, manuals, books, excellent condition £110. Contact R.F. Burke, Cambridgeshire. Tel: (0945) 65940
- BBC B with ATPL sideways expansion, Trackerball, Torch Z80 second processor, two 80 and one 40 track disc drives with PSU, software. Contact John Baraclough, Glasgow. Tel: (0360) 50951
- BBC B, cassette recorder, lightpen, joysticks, 25 games including Elite, instruction and programming manuals £100. Contact Mr M Jennings, Fleet. Tel: (0252) 629338
- Master 128 computer, clean as new £230 inc p+p. Canon BJ 10ex printer with Archimedes driver £200 ono Archimedes Rom podule £40. Contact A Fairclough, Merseyside. Tel: (051) 606 0289
- Electron, AP1, AP2, AP3, Lisp, joysticks, manuals, magazines, books, software, many games, Mini office etc, all good condition £130 the lot o.n.o. will split. Contact A Piper, Hampshire. Tel: (0329) 281930 evenings
- PRMs £50, Autosketch, SV-Solidcad, SuperPlot, WorraPlot all for £50, Arcscan plus Risc user manuals Jun 89/ Mar 92, home accounts, HD companion, games £50. Contact Mr R Glass, Huntingdon. Tel: (0480) 434184

- BBC B Issue 7, Solidisk DDFS, Econet, many application Roms, Cumana single disc drive, dust covers, manuals £250. Contact A King, Weymouth. Tel: (0305) 779603
- BBC B+ sale following Upgrade, Wapping Editor. Quest Paint, Autodial Modem with Rom, double sided 40/80 drive, games, lightpen, boxed offers. Contact Miles Carter, Southampton. Tel: (0703) 260088
- Archimedes A310 colour monitor, 20Mb hard disc, sealed new s/w, games, 3Mb PD s/w, boxed with manuals, dust covers £700 ono contact Mr R Collins, Worthing. Tel: (0903) 690031
- A3000, 40Mb hard disc, 4Mb Ram, colour monitor, SCSI interface, monitor stand, manuals, software – £850. Contact M Gidey, Northants. Tel: (0933) 55273
- A3000 Learning Curve, colour monitor and stand, 2Mb Ram, lots of software and games, excellent condition £695 ono. Contact Mr A Greenland, Newcastle upon Tyne. Tel: (0661) 25161
- 46 issues of BAU (85-89) £20 (£10 carriage), 34 issues of Micro User (85-89) £15 (£9 carriage). Contact Mr M Graham, Middlesex. Tel: 081-847 0364
- A3000 2Mb, Acorn colour monitor, 2nd 3.5in floppy, Panasonic KX-P1081, serial chip, new PC Emulator, mint condition £650. Tel (0222) 759617 (Cardiff)

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# ARCterm 7

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This new release of our popular comms package now supports Minitel emulation and includes an Econet modem server. Recommended by Hampshire LEA. Existing users return both disks and SAE for upgrade.

# A5000 IDE drives

These drives fit in the second floppy slot, in addition to the existing 40Mb drive. Transfer rate is 1050k/s.

A5000 internal 120Mb 17/9ms Quantum	£289
A5000 internal 240Mb 17/9ms Quantum	£489

# IDE

Complete systems. MEMC1a/backplane required. Typical transfer rates are 700k/s for 40Mb and 900k/s for 100Mb.

A300/400 internal 20Mb 25ms Conner	£139
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A300/400 internal 100Mb 17ms cached Seagate	£299

# SCSI

We supply Morley cards - the fastest on the market. Typical transfer rates are 1000k/s for Quantums and 2150k/s for Fujitsu. All drives are cached. Add £50 for a cached SCSI card if you require one.

A300/400 int 50Mb 17/9ms 2yr Quantum	£319
A300/400 int 100Mb 17/9ms 2yr Quantum	£429
A300/400 int 200Mb 17/9ms 2yr Quantum	£699
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(Add £70 for A3000/5000 external systems)	

# 20Mb Floptical Drive

Our floptical drive will read and write E format disks (F format with RISC OS 3) as well as native 20Mb. FLOPFS is supplied with the external drive which works with most SCSI cards (or add £100 for a Morley card). The A5000 internal comes with our own SCSI interface designed specifically for the floptical drive, plugging into the Econet port - using no slots. Transfer rate is 100k/s typically & 80ms seek time.

External including 1 floppy	£399
Internal A5000 including controller & 1 floppy	£359
Floptical floppies (20Mb)	£20

# Coming soon

- IBM keyboard/mouse interface 100% compatible.
- 1/2/4Mb (3.2Mb formatted) floppy interface.
- 8-port serial card for RISC OS/RISCiX use.
- 64kBit synchronous ISDN adapter card.

All disk systems come tested and formatted with all cables. Delivery on hardware £10+VAT. Education is entitled to a 5% discount on all products.

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# THE SERIAL PORT



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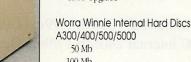


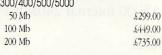










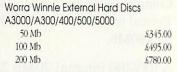








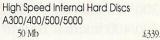












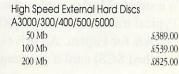












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The new Worra CD ROM drive offers a low cost entry into the world of multimedia with performance comparable to similar drives. The High Speed CD ROM drive offers the highest possible performance and is better able to cope with more demanding applications, such as Acorn 'Replay' sequences, than cheaper drives.

Prices shown include SCSI interface (except CDROMs which require SCSI card and CDFS

Always state computer type when ordering

Prices exclude £10.00 p&p

Each hard disc comes complete with the following FREE software:

Genesis, Euclid, Disc Tree, RISC OS Companion, Worra Battle

and VAT



£299.00

£399.00

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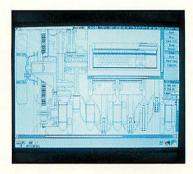
Telephone for **Education Prices** (and we'll knock off the cost of your call!) Oak PCB is a brand new RISC OS compliant PCB and schematic design package. A multi-tasking desktop user interface based on !Draw ensures that users can quickly exploit the powerful draughting features, and create complex multi-layer circuit boards or schematics. Output is to RISC OS printer drivers, or the plotter driver supplied. Features Drawfile import/export, associative editing, drilling data, solder resist etc. etc. Supplied with comprehensive PCB and Schematic libraries.



# WorraCAD

£99.95

WorraCAD is the de-facto standard RISC OS 2D CAD package. Working to 18 significant figures precision, WorraCAD provides all the tools required to produce superb accurate technical drawings. Outputs to plotters and RISC OS printer drivers. Features tangents, normals, intersections, parallels, automatic associative dimensions, grid, Drawfile export, linestyles, 16 layers, hatching, mirroring and stretching, CNC link available to Boxford Lathes. Libraries available seperately.



# Draw Print & Plot

£39.95

Draw Print & Plot supercedes our earlier plotter drivers for Drawfiles (WornaPlot and ArcSign - upgrades available). DrawPlot accepts drawfiles and creates output on HPGL compatible plotters. Features outline fonts, sprites, filled areas, line thickness and depth sorting to avoid colours overlapping. DrawPrint accepts drawfiles and allows them to be printed to RISC OS printer drivers at a different scale - for example to create huge posters (cropmarks are created automatically).



# **KiddiCAD**

£69.95

KiddiCAD is an exciting 3D building block package designed for younger users. 3D models may be created, using the library of building bricks supplied, and rotated in real time. The high speed of operation and the live 3D view allows users to quickly gain an understanding of work in 3D. Models may be output as Spritefiles in colour or wireframe mode, and can then be imported into painting packages, DTP, Genesis etc.



# Leaders in CAD for the Archimedes

prices exclude P&P (£1.50) and VAT



# A3000 RAM Upgrades

from £48.00

To really make the most of your A3000 you need more than the basic 1Mb of memory. The Oak A3000 RAM card offers an increase in memory to 2Mb or a full 4Mb to greatly enhance the usefulness of the machine. The RAM card has low power consumption and gives off a minimal amount of heat so that reliable operation is ensured. The card is fitted with top quality connectors to eliminate problems due to poor electrical contact. Fitting the card is simplicity itself, and no soldering is required. Three versions of the card are available, a straight upgrade to 2Mb at £48.00, a 2Mb card at £65.00 which can later be upgraded to 4Mb and the full 4Mb upgrade at £156.00.

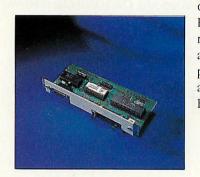


# from £38,00

# A3000 Expansion Ports



In response to demand from users, Oak Solutions have produced a range of interfaces for the A3000. The interfaces replicate some of the expansion ports found on the BBC model B/Master 128 series computers. To ensure the highest levels of compatibility, the interfaces are based upon the same integrated circuits as are found inside the



older machines. The software drivers are provided in ROM on the expansion cards and support all the necessary calls which Archimedes and emulated BBC applications expect. For the technically minded, the user port supports OS\_Byte calls &96 and &97, and the analogue port enables the ADVAL keyword in BBC BASIC.

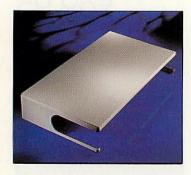
Three interfaces are available, and all occupy the internal expansion slot in the A3000. The first interface provides a User Port only and is ideal for use with devices such as the Concept Keyboard. The Concept

Keyboard port costs £38.00. In the middle of the range, the User/Analogue port is available at £45.00 for a range of control applications as well as use with analogue joysticks etc. At the top of the range, the User/Analogue/Disc Buffer at £55.00 provides all the above facilities and also allows extra external floppy disc drives to be connected to the A3000. Comprehensive disc mapping options allow many combinations of drives to be used, and the card is supplied set up such that existing BBC floppy drives may be connected direct to the A3000 and appear as ADFS drive 1.



£14.95

# A3000 Monitor Stand



The Oak Solutions A3000 monitor stand has been designed to fit stylishly over the A3000. It is manufactured from heavy gauge steel and can support up to 20" monitors. The stand is hand finished in a tough textured paint which perfectly matches the A3000. The sides of the stand are open providing ventilation for the A3000 and also giving access to the floppy disc drive and the power switch.

# The best in A3000 expansion

Prices exclude £3.00 p&p and VAT Telephone for Education Prices



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Tel: 0274 620423 Fax: 0274 620419



# Battle of the Somme

The Battle of the Somme is a multimedia presentation focussing on the events that occurred around the 1st July 1916. The software allows pupils to explore text, sound, graphics, photographs, maps, laservision stills and movie sequences.

The Imperial War Museum have released movie film, photographs and sound recordings for the production of a laservision disc which is available for use with the package.

The package was conceived and produced by the Netherhall School in Cambridge with support from the NCET. It was authored using Genesis II and is focussed on cross curricular resources with worksheets supporting its use in History, English, Maths, Geography, Music and Art.

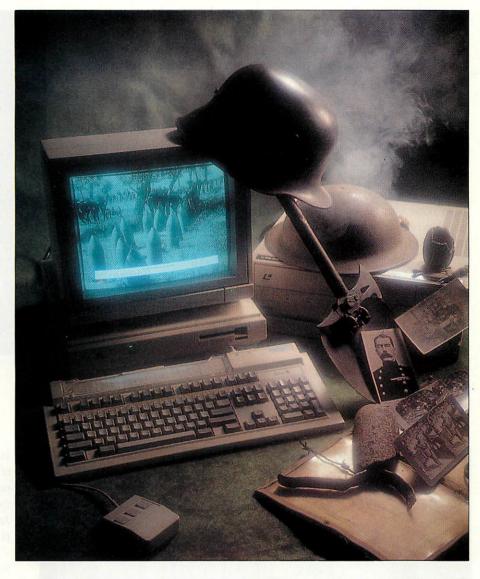
All materials are accessed via a library using single mouse clicks to navigate the system.

A letters section contains postcards sent back from the trenches by one soldier during 1915 and 1916 which provide an excellent stimulus to written work in the classroom.

A calendar provides easy cross referencing and fast access to specific events allowing the user to dip into dates between 1914 and 1916.

A Roll of Honour database lists all soldiers in the Cambridge Battalion killed on 1st July 1916. This data can easily be amended to contain information more appropriate to different regions. These lists provide good stimulus for activities in Geography and Mathematics classes as well as History.

The application contains songs that were sung to entertain the soldiers. The tunes may be played using the computer's sound system, or a rendition by a male voice choir can be heard via the laservision disc.



A set of maps allow access to information relating to specific areas - starting with a view of Europe and zooming right in to the front lines. A Concept Keyboard may be used at this stage as an alternative to the mouse.

Digitised still images, and those from the laservision disc may be accessed and these provide a wide range of images related to the battle. Audio sound tracks on the laservision disc allow the user to listen to interviews with a variety of survivors of the Somme, and the forty minutes of movie film have been segmented into short clips related to other materials in the package.

A textbook section provides important factual background to the events which took place. Selections include Women at War, Propaganda, The Air War and Joining Up.

# Multimedia across the curriculum

Software site licence £95.00 Software site licence including Laservision disc £145.00 Laservision Disc £100.00 Prices exclude £2.00 p&p and VAT



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Oak Recorder is Oak Solutions' low cost sound sampling microphone - the ideal way to capture sounds for your Archimedes. Oak Recorder consists of a hand held omnidirectional electret condenser microphone, with integral wind shield and on/off switch, which simply plugs into the printer port of any Archimedes (including A5000) via a 3 metre length of shielded cable.

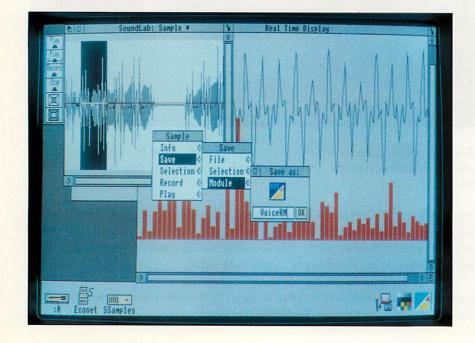
Oak Recorder is robustly manufactured to withstand the rigours of the classroom, and could not be easier to use. The software supplied with Oak Recorder allows samples to be recorded, played back and transferred to Genesis II and other Archimedes applications via the standard Armadeus file format.

Oak Recorder has several modes of operation; recording may begin on a button press, or be set to start when the sound level exceeds a certain threshold. Sound samples may be edited, and the start and end positions of the sample may be adjusted so that only the required portion of the sound is saved.

A Genesis II support module and application is also supplied for users wishing to integrate real-time sampling within their own Genesis applications. This allows exciting applications such as talking books, interactive modern language self study packages, special effects for school drama productions and sound libraries to be created. Add £3.00 to cover p&p.



£14.95



# Sound Lab

In response to demand from users, an enhanced version of the software supplied with Oak Recorder has been produced. Many new features have been added, and these will be particularly useful to those with Archimedes music packages and for use in the school physics laboratory.

Sound Lab allows samples to be turned into relocatable modules to provide voices for applications such as Maestro, or to allow the internal voices of the computer to be replaced - your computer could be made to say 'sorry' instead of just beeping when an error occurs!

Sound Lab also provides a real time display with a spectrum analyser and a simple oscilloscope - ideal for investigating waveforms and for doing simple experiments.

Add £1.50 to cover p&p if not ordered with Oak Recorder.

# Don't forget to order your Oak Recorder

Prices exclude VAT Telephone for Education Prices



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Genesis II £129.95

The Genesis family of products represent the de-facto standard in multi-media on the Archimedes. Genesis II is the most powerful application in the range, provides all the facilities of Genesis Plus, as well as a comprehensive scripting language which allows even non-technical users to generate their own powerful desktop applications. The script language has the power to control CDROMs and LaserVision players, and can be driven by devices such as Concept Keyboards for special applications. The language can be extended by compiling external modules using the ABC compiler. Upgrades are available to existing users of Genesis and Genesis Plus (including Learning Curve).



£14.95

# Genesis Script Language Book



The basic use of the Genesis Script Language is covered in the Genesis II manual, but to get the most out of the language and to explore its ability to manipulate lists and databases, to create dialogue boxes and menus and a whole host of more advanced functions, the Genesis Script Language book provides an essential reference work. The book contains a full description each of the 300+ script keywords in its reference section and has chapters on each key area within the script language. VAT is NOT charged on this product.

# ABC BASIC Compiler version 3

£99.95

The Archimedes BASIC Compiler is the only serious BASIC compiler available for the Archimedes. It is especially suited to the professional user who requires the speed and protection of a compiled language whilst retaining the flexibility of using an interpreted language during the development phase. Compilation under Version 3 takes place as a RISC OS task thereby allowing the machine to be used for other jobs at the same time. Relocatable modules may be created allowing star commands to be implemented, along with library modules which can contain functions and procedures which may be called from any program compiled using ABC, including Genesis II.



£99.95

# Cambridge Pascal



The Cambridge Pascal compiler supports a comprehensive version of the Pascal language and includes many extra features such as full string and error handling. Additional extensions allow the use of random access files and provide direct access to the operating system routines including star commands. The compiler runs under the RISC OS desktop and supports conditional compilation, include files and compilation to relocatable modules. Comprehensive error messages and a trace facility ease the development process. A library of procedures and functions is provided to support access to the window manager.

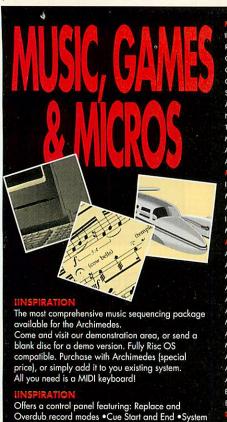
# The best in Languages for the Archimedes

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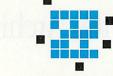
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# WORD FOR WORD

Lost for words? Then a computerised thesaurus could be the answer. Dave Lawrence investigates a new desktop release

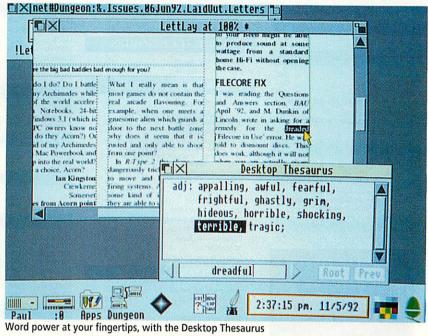
n the 32-bit world, most large word processors and document handling systems now come complete with an on-line spell checker. What has been missing in the electronic office, however, is some sort of thesaurus or synonym finder. At least up until now.

Risc Development's latest release, Desktop Thesaurus is a Risc OS application that tries to emulate your faithful Roget's. It does this by using a small desktop window, made up of a single-line text entry slot, a scrollable display area and a couple of buttons. Typing a word and pressing RETURN will scan the database and list the synonyms. The display window can be scrolled by means of a vertical scroll sausage on the right. As some of the entries are rather extensive, it would be nice to be able to enlarge this area, but there is no resize gadget.

Synonyms are stored along with their parts of speech so, for example, entering the word 'BRIDGE' results in the two lines: 'NOUN: arch. connection, link, . . .' and 'VERB: connect, cross, join, . ...'. From here, there are two ways to proceed. If you point at one of the chosen synonyms and click Select, it will copy it into the 'source slot' and display the synonyms for that word. This process can be repeated until you find your desired word; clicking on Prev will take you back to the previous word, Root will take you back to the first word.

Clicking with Adjust, on the other hand, inserts the letters of word into the keyboard buffer as if you had typed them. If you are hard at work on a piece of text in an editor, the word would appear as if by magic. In some editors (for example, Ovation and Impression) if you select a word and press a key, the word is deleted first - in effect, the old word is replaced with the new one. This functionality continues to work even with the thesaurus' Adjust-click.

One further feature of the program makes automatic searches even easier. If a text file (usually one word long) is taken from a document and dropped on to the 'source' slot, it will find a synonym without the need for any typing. If you were using a highlight-equals-replace editor (as outlined above), a word can be highlighted, 'saved' to the thesaurus, a synonym found and Adjust-clicked, to replace the original word. This is the closest you could get to a builtin, 'hot-keyed' thesaurus without actually having one. But there are two problems with this system. Firstly, if you are using Impression, you must remember to switch off With Styles before transferring your word. If you don't, the styles will be transferred along with the word and you could end up looking for a synonym for some spurious piece of text, such as a curly bracket!



# TRADITIONAL METHODS

As you can see from the above screenshot, the word dreadful produced a number of alternatives using the Desktop Thesaurus. But how does the program compare with more traditional means?

Roget's Thesaurus is a book for the purists. Roget's uses an indexing system and there are four separate sections listed under 'dreadful'. A worthy tome, but definitely not for those in a hurry. The Collins Paperback Thesaurus in A-to-Z Form takes a different approach. It is arranged in alphabetical order, so it is quick to use. But not, of course, as quick as the Arc. The synonyms listed are strikingly similar to those found by the Desktop Thesaurus, although it does produce a few more. However for speed and convenience, Desktop Thesaurus has the edge.

# PRODUCT DETAILS

**Product: Desktop Thesaurus** Suppliers: Risc Developments Tel: (0727) 40303 Price: £19 plus VAT

Secondly, in many editors, double clicking a word includes any trailing spaces which seems to throw the thesaurus (it finds the next word in the list) as do leading spaces (it always finds the synonyms for A).

The entire word base can be exported, altered and re-imported to allow you to add your own words. There are over 13,000 present with over 94,000 synonyms – adequate for most needs.

The only drawback of a digital thesaurus is the size of the data. Special techniques can be employed when compressing a plain, alphabetical dictionary and they can typically be reduced to one fifth of their original size. A thesaurus will contain an apparent jumble of words because each entry will need a list of synonyms. At the moment, Desktop Thesaurus almost halves the data but a more efficient system is a possibility for the future.

To alleviate the space problem, the data file remains disc based. From hard disc, access time is almost instantaneous; from floppy it takes a couple of seconds at the most - quite an acceptable delay. The only drawback of a floppybased system is the disc swapping involved.

Desktop Thesaurus will multitask with Edit on a 1MB machine, but you will need 2MB or more if you publish on your desktop. Although the thesaurus is stored on disc, it still manages to take up 160K of application space, presumably to speed up access to the file. But overall, the package is well-presented and functions very nicely. For £19 you can't really go wrong.

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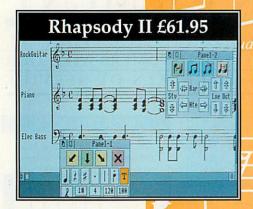
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# GRAMS

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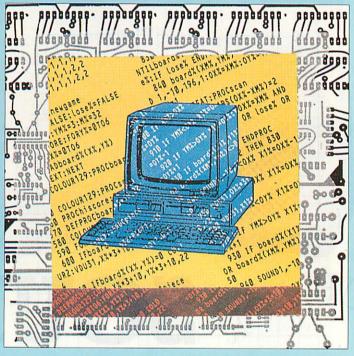
All you need to do to use the programs is copy them in from yellow pages. (Full instructions on how to type in a program are given on p79). If you are a subscriber to BBC Acorn User you have an added advantage - you can simply load the programs from your monthly disc.

This month we have a varied selection, from a stunning multi-colour graphics demo, to a fully blown application that will provide you with a year planner and a desktop diary. But first of all, for those people who want to make all manner of sounds without expensive hardware or software - we have part two of our sound series on p62.

This month, David Radford introduces the concept of harmonics. The program provided with David's article allows you add harmonics to the basic waveforms described last month. Now you can begin to create lifelike noises, rather than just beeps. David has even included a keyboard routine, so you can play notes and chords. All in all, it is a fascinating insight into the world of computer generated sound.

# ONE AND ALL

But perhaps you're not a programmer? Well you don't need to be! The majority of the programs in this section can simply be used; you don't need to know how they work,



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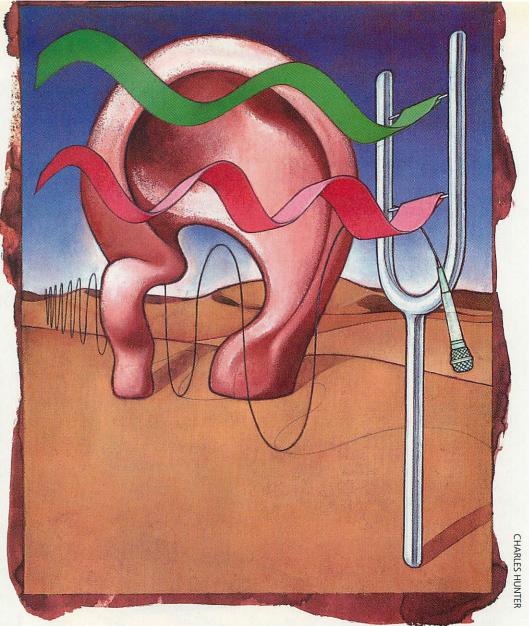
CONTENTS

just how to work them. \*INFO, however, goes one step further. Not only do regular BAU columnists, Dave Acton and Dave Lawrence, present you with many useful and fun programs but they take the trouble to explain how they work. Rest assured, after a few months of reading \*INFO, you will know your Basic keywords from your assembly language operands!

Their Star Program this month is an eight-bit version of Mark Sidey's liquid simulaprogram, originally featured in our March 92 issue as a 32-bit program. It is equally at home in the physics classroom, teaching the principles of capillary action, as it is out of the school classroom being used for fun. Turn to p61 for a full explanation of how it works.

For those of you who are taking your first steps into the programming world, try turning to p67. Here the two Daves take a program to pieces, and explain it line by line, so you can pick up programming tips from the experts. Furthermore, each month they will explain one aspect of programming, and the best way to do it. This month they explain loops so turn to p62 for details. Oh, and 32-bit users, don't miss Jan Vibe's dancing fractal fern!

The second part of Dave Acton's article about the language C, is found on p77. If you're thinking of a career in computing, then C is the language to learn. But you don't have to understand C programming to use the example program - a desktop year planner and diary: it can also be loaded from the monthly subscribers' disc.



This month David Radford adds harmonics, volume and pitch to his sound concoction

# JP FOR SOUND

imple sounds are created by simple sound waves. This much was proved last month by our basic Wave program. However, the more interesting the sound, the more complicated the sample needs to be and this month we are going to venture a little further down the sound trail.

A sound has three main features: volume, pitch, and timbre (the shape of the waveform). Let's start this month by taking a look at volume. When you apply a special effect to a sample, the volume of the sample may sometimes be reduced. As this drop can be large, you often need to raise the volume afterwards. This is done by a process known as scaling. Before you can do this, however, you need to know what the current volume is.

Let's take a simple sine wave as an example. (If you can't remember exactly what a sine wave looks like, take a look at the top diagram opposite.) Like all sound waves, the sine wave moves backwards and forwards about a central line. The volume or amplitude of a sample is determined by how far the wave moves from this central line.

Actually measuring the amplitude at a certain point in the sample is very easy, as the sample data itself tells us the distance the point is from the centre line, and also whether it is above or below the line. The problem is that the amplitude must be measured at the point where the wave is furthest from the line, and you don't automatically know where this is.

Another twist is that the volume of a real sound does not usually stay the same from start to finish. For example, imagine striking a key on a piano. At first the note is loud, but it fades away to nothing. This causes a problem if you wish to alter the volume of a sample that you obtained using a sampler.

To get around this, you usually measure the overall volume of the sample: simply look through the sample to find the largest distance the wave travels from the centre line and use this as the volume. The advantage of this method is that all the bytes in the sample fall into the range -V to +V, where V is the volume you have measured. Once you know the current volume, it is easy to change it, using a process known as scaling. Scaling involves multiplying all the bytes in the sample by a number. This number is found by dividing the desired volume by the current volume. The general equation is: new data = old data \* new volume / old volume

The first listing called Volume shows this in action. When you run the listing, you will be asked whether you want to use Basic or machine code. The two versions of the routines are included in the same program for comparison. The Basic version is very slow, but it you may find it easier to understand than the machine code version

The parts that do all the work are FNmeasure and PROCscale. A pointer to the sample data is passed to both, as well as the length of this data. PROCscale needs a third parameter, which is a value to multiply all the bytes in the sample by. This value must first be multiplied by 128, so that the procedure can use integer arithmetic for speed. Note that Armadeus files have a single byte at the start, giving the sample period and you must not include this in the sample data.

# **HARMONICS**

Last month, I promised to cover a new synthesis technique and one of the simplest, and therefore most common, is harmonics. If you used last month's Wave program, you may have noticed that the sine wave was more boring than other waves, such as the square wave. This is because it is the simplest waveform around, a property which makes it very useful for synthesis.

Have a look at the diagrams opposite, which portray three sine waves. The top drawing is the fundamental or first harmonic. The drawing below it is two sine waves stuck together, but occupying the same space. This is the second harmonic. The bottom drawing is the third harmonic, which is three sine waves stuck together, but still taking up the same space as the other harmonics. Get the idea?

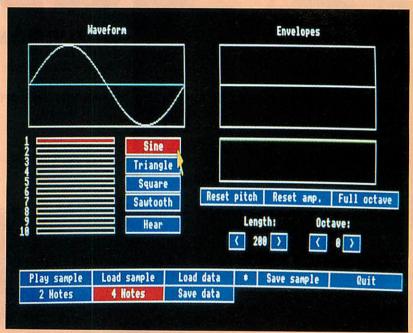
Harmonics are the same wave at different frequencies. The theory behind harmonic synthesis is that sounds are made up of one main sound (the fundamental) plus several harmonics of this sound. In theory, by joining the right amount of harmonics of a simple wave, such as the sine wave, it should be possible to create almost any waveform. Of course, in practice it doesn't quite work that way.

# CHANGING THE PITCH

Altering the volume and adding harmonics is a simple task when compared to changing the pitch. Most people have heard the effect of playing a record or a tape at the wrong speed. Play it too slowly and the singing becomes drawn-out mooing. Play it too quickly and your living room is filled with frantic mice.

The same principle can be applied to samples. If you play them back faster than the rate at which they were recorded (or synthesized) you will raise the pitch. Similarly, slowing down playback will lower the pitch. One side effect of this is that, because the speed of the sample changes, so does its length, and low notes last longer than high notes. To avoid this, you

# **WORKING WITH HARMONICS**



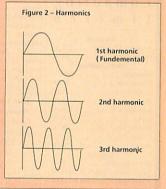
The diagram above shows the Wavegen2 program in action, displaying a simple sine wave. This is achieved by highlighting the sine option as shown. The shape of a sine wave should, by now, be familiar, and needs no further explanation.

In the example above there are no harmonics added to the fundamental sine wave. Slider bar number one represents the fundamental wave form and this is at full level. However the other bars, which represent the various harmonics are at zero level.

But what exactly is a harmonic? Well, the diagrams opposite should give you some idea. Basically they are related to the fundamental wave but there are two, three, or more, complete waves within the original wavelength.

Experiment by adding harmonics to a sine wave. (By sliding the second bar you can adjust the level of the second harmonic and so on. ) You will find that these levels can be used to add resonance to the original sound. Harmonics occur in all natural sounds and you should also find that their addition to our sound program helps to create 'fuller' sounds.

Figure 1 - The maximum volume level Amplitude



should try not to play the sound too far away from its normal pitch. The simplest way of changing the playback is to use the command:

SYS "Sound\_Configure",,,<period>

where <period> is the sample period to use for playback. Lower sample periods cause higher notes to be produced. (The default value is 48.) But, this method is not accurate enough to play musical notes. A way of altering the speed of a sample without having to alter the sample period is needed.

Imagine that you have a pointer to some sample data, that you want to output to the speaker. As each byte is sent to the speaker you add one to the pointer, to move on to the next byte. You carry on, until the pointer reaches the end of the sample. The end result is that the sound is played back at the normal rate.

Now, supposing you repeat this, but add 0.5 to the pointer instead of one. This time each byte is



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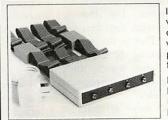
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sent to the speaker twice, as two bytes are sent to the speaker to move the pointer on by one byte. So the sample takes twice as long to be played back. In effect, the speed is reduced to by half, so the sound appears to have a lower pitch. By adding different values to the pointer, we can produce a range of speeds, more than enough to play any tune. This technique is known as a phase accumulator.

Luckily, there is a command provided under Risc OS to calculate a phase accumulator value for you: SYS Sound\_Pitch, <pitch> TO <phaseacc> where <pitch> is the note that you need a phase accumulator for, and <phaseace> is the value calculated. The pitch value must be in the new extended format, as opposed to the old BBC format), where middle C is &4000. (For more details, look in the Basic User Guide in the chapter on Sound.) The value returned by Sound\_Pitch is the real value multiplied by &1000000. This is because only whole numbers can be returned from this call.

And if you haven't understood any of the above, then don't worry: The second listing called Pitch will do the hard work for you. When you run it, you will be asked to enter both the current pitch and the new pitch. You should give the pitches in the form C3 or D#2, that is, the note name followed by the octave number (C3 is middle C). Samples produced using the programs in this series are created with a pitch of E3.

# TURN UP THE VOLUME

The reason we have covered volume in so much detail this month is because it is fundamental to special effects. A good example of this is last month's Fuzz program. As the volume of a sample may be changing all the time, Fuzz first divides the sample up into lots of miniature samples, each 256 bytes long. This means that the volume of these must be fairly constant.

The volume of each chunk is measured, but rather than scale all the bytes to a new volume, the value for the current volume is scaled down by the fuzz level. Any of the bytes in that chunk that go out of the range -V to +V, where V is the scaled volume, are changed to -V or +V, depending on whether they were positive or negative. This has the effect of chopping the tops and bottoms off waves. The smaller the fuzz level given, the more is chopped off. As you can see, volume lies at the heart of many special effects.

Anyway, that's quite enough theory for one month, so let's have some fun! Our final listing, WaveGen2 is an advanced version of last month's Wave, incorporating all the techniques mentioned so far. That's all for now. Next month I'll be looking at some standards for use in samples. I'll also be showing you how you can incorporate sound into your own programs.

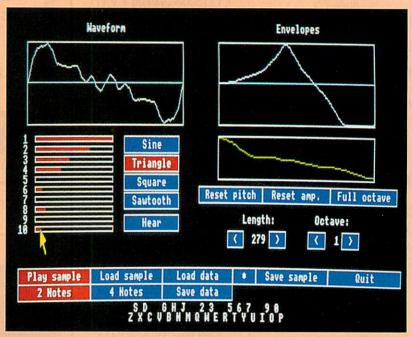
# **YELLOW PAGES**

The main program this month, WaveGen2, is shown in action above and can be found on yellow pages. The other two example programs, Volume and Pitch can also be found in yellow pages. As always, if you are a subscriber, you can load the programs directly from your monthly disc.

# **USING WAVEGEN2**

When you load up the program (see our yellow pages box below) you will see a screen similar to the one shown below. Forget the right-hand side of the screen for the moment and concentrate on the left. The row of ten bars represent the first ten harmonics of a sine wave. By dragging the bars, you can alter the level of each harmonic in the sound. The result is shown in the large box at the top of the screen and you can listen to it by clicking on the Hear option. You can also change the basic wave and the shapes available are sine, triangle, square and saw-tooth, selected using the icons to the right of the slider bars.

Once you are happy with a waveform, click Hear again to turn the noise off. Now try clicking on the Play sound icon. When it turns red, you can play your waveform back at different pitches using the computer's keyboard. The keys are arranged in the style of a piano keyboard, and this layout is displayed at the bottom of the screen. Pressing the E key will play the sample at its natural speed; any other key will play it faster or slower.



You may sometimes notice a slight delay before the note sounds. This is because the sample was re-calculated for some reason, and this usually only occurs after editing. There are two icons which allow you to control the number of notes you can play back at once: two notes will sound louder than four notes but chords will become impossible.

If the sound plays too high or low for your liking, the octave may be changed using the arrows either side of the octave number, which is about half-way down the right-hand side of the screen. Similarly, the length of playback can be changed using the length arrows.

As with last month's Wave program, these waveform do not sound very natural. This is mainly because, with real sounds the volume changes. We can do something similar, using what is known as an amplitude envelope. An envelope is a way to change the characteristic of a sound, over a period of time. This program has both an amplitude envelope and a pitch envelope and these are the two boxes on the right: the top box is pitch and the bottom one is amplitude. Simply hold down Select and drag the mouse around to change them.

Note that, with the pitch envelope, the middle line represents no change, the top of the box is up one octave and the bottom is down one octave. You can alter the range using the Full octave icon about half way up the screen on the far right. As before, you can play the sound back using the keys, providing you enable this option by choosing the Play sound option. If you make a mess of the envelopes, Reset pitch and Reset amp will put things back to normal for you.

When you are happy with a sound, you can save it by clicking on Save data at the bottom of the screen and typing in a filename. This can be loaded back later using Load data. Alternatively, you can save it as a sample for use in another program, or perhaps further processing, for example using the Echo program from last month. However, you will not be able to edit it in this format. Any sampled sounds you may have lying around can also be loaded and played back with the keys. The waveform shown above sounds rather like a dog barking, take a look at the way the pitch rises towards the middle of the note, like a dog's bark. With a bit of practice you could have a chorus of dogs barking a simple tune!

Incidentally, if you own a copy of Tracker, you may be interested in knowing that it can load any samples in Armadeus-format and, therefore, any sample created with the programs in this series. However, first you will need to set the sample format to linear-signed using the options window within Tracker.

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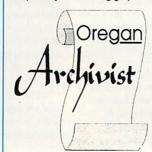
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# WINDOW

A new application helps desktop programmers to design their own windows. Dave Acton puts it to the test

natural part of writing a Risc OS application is the design of windows and the icons that live in them. All but the simplest applications store their window definitions in template files and so a template editor is needed to create and manipulate them.

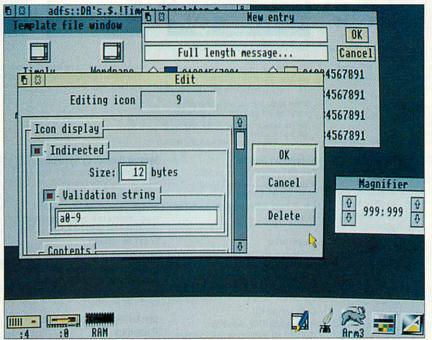
Until recently, Acorn's own template editor FormEd was the only choice and, although it is functional, there has always been room for improvement. WindowEd aims to fill the gap and could benefit all desktop programmers.

A major failing of the original version of FormEd is that all windows defined in a template file are shown on screen at the same time. and clutter up your desktop. However, the new version of FormEd, provided with C Release 4, can show windows within windows.

WindowEd also provides a viewer that can list your windows, similiar to the way that Paint provides a list of sprites in a file. You doubleclick on one window to display it, just as you would select a sprite in Paint. And WindowEd allows you to edit several template files simultaneously. This makes borrowing parts of one template file for use in another much easier. You can merge template files with FormEd, but it is messy by comparison. Tied in with this, is another nice little feature of WindowEd that allows you to grab an icon and copy it. You can grab icons from the current template files, from other template files and even from windows of other applications.

A less major, but nonetheless irritating problem with FormEd relates to windows without title bars or close icons. If you are designing a pane for example, that will sit on top of another window, it may not have a title bar. To move it around the screen during the design phase with FormEd, you have to add a title bar, move the window and get rid of the title bar again - a real pain. And because the window must remain on screen, you can often end up with a whole gang of immovable windows blocking your way.

WindowEd addresses this problem in a novel way, with a cute tool panel. On this are six icons, one of which is move. Click on move and you can drag an 'immovable' window around to your heart's content. Similarly there is a close icon for windows without their own, and other buttons for moving windows to the front, back and scrolling them around. Even more delightful, these tools, like the grab icon facility, work on the windows of other applications. Four more utilities come with WindowEd. Bin is a typical



Editing the icon attributes using WindowEd

desktop dustbin. HotSpot shows the area around the pointer magnified in a window. This is what the magnifier on the Applications disc should have been and is surprisingly useful. MouseLock can lock the pointer horizontally or vertically. This allows you to move icons and so on without losing the alignment - a clever way around one of the basic problems of window designing. Finally, Command allows you to create windows with resident \* commands. Any files dragged onto these windows have the resident commands applied to them, recursively if needs be.

Like all the best pieces of software, WindowEd has an unfussy, logical feel, with 3D style icons and a pointer that changes shape if a special menu is available and so on. Accompanying the software is a manual I would rate highly with a clear tutorial chapter and a manual-ette describes the four extra utilities. The only grumble I have is that when a window has undergone many changes, you will sometimes need to re-number all, or some, of the icons. FormEd's menu-based method is much quicker than using the Edit Icon window of WindowEd. Aside from this, WindowEd is an excellent package - well written, well presented, well documented and well worth the money.

# THE OTHER ED

FormEd, Acorn's template editor comes with Acorn C. The application has served desktop programmers well over the years and has undergone various enhancements. Although it is not officially a piece of public domain software, FormEd turns up all over the place on bulletin boards. The latest version comes with Ansi C release 4. (Comments in this review have been based on version 1.01a.)

# PRODUCT DETAILS

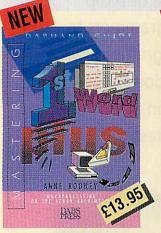
**Product: WindowEd** Supplier: Armen Software, Laxton House, Milton Road, Oundle, Peterborough, PE8 4AB. Tel: (0832) 273444 Price: £35 or £100 for site licence

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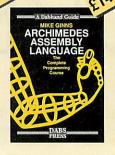
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# **Z88 Pipedream Guide**

John Allen's detailed work on all aspects of Z88 PipeDream. Good explanations of printing. Price £14.95

# Psion LZ OPL Guide

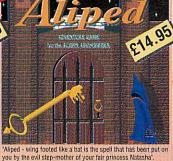
Ian Sinclair's guide to OPL programming on the LZ series of Organiser machines. £12.95



Harry and Dave manage the laundry firm, but things have been going wrong. They work all night but will they put things right? Multi level game, high quality graphics, simple key controls for easy movement of characters. Needs 1MB, RISC OS compatible.

"a great deal of fun" "fiercely competitive" "to the accompaniment of decent music, effects and humourous speech"

Duncan Evans - ARCHIMEDES WORLD



'Aliped - wing footed like a bat is the spell that has been put on you by the evil step-mother of your fair princess Natasha'. Smooth multi-directional scrolling castle, stunning use of stereo sound, high quality graphics. Needs 1MB. RISC OS

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Dave Lawrence and Dave Acton present their monthly mix of programs, for all Acorn users

# STAR PROGRAM WATER WORLD

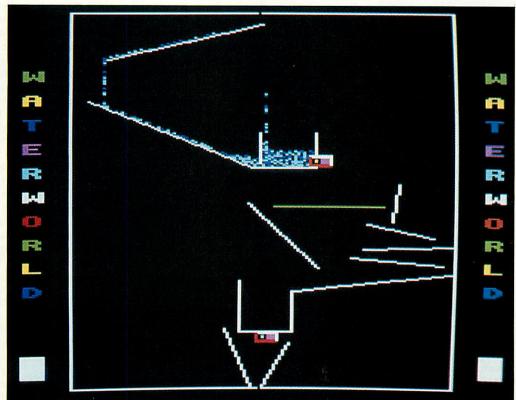
Programs: WaterEd, WetSrc Description: Graphic demo Authors: Matthew Godbolt, Richard Talbot-Watkins Machine: Eight-bit

Listing: 430 lines of machine code plus 150 lines of Basic

The March 92 issue of BAU featured a water simulation of by Mark Sidey. It showed water cascading down the screen, stemmed only by strategically placed obstacles. Sadly, however, for eight-bit users, the original version was exclusively for the Archimedes but in response to our plea we can now present an excellent BBC version.

The eight-bit WaterWorld differs from the Arc version in a couple of ways. Firstly, the Beeb's processing power isn't quite up to the Arc's 800 water droplets, so 256 is the maximum. Secondly, due to the lack of speed and a mouse, interactive editing is not possible. Instead, a system of valves is used to compensate for this omission.

To use the program, the listing WetSrc must be typed in. Before running it type PAGE=&3000. This produces a number of tables and assembles the main code which is saved as WaterMC. Next, the front-end WaterEd can be typed in. This allows objects to be created. When run, the screen clears and you are presented with a small pixel cursor which can be controlled with Z, X, ?, \*. SHIFT can also be used to accelerate the cursor movement. Pixels are set by pressing RETURN and deleted with DELETE.; rubberbanded lines are selected and terminated with the L key. The



Water, water everywhere... eight-bit liquid simulation

simulation is started with the TAB key and ESCAPE returns you to edit mode.

The original sorting platforms are faithfully reproduced in this eight-bit version. To select the green sorting platforms, press 2. Blue droplets flow right and red droplets go to the left. Pressing 1 will reselect normal platforms.

As mentioned, no interactive editing is available. Instead up to four 'valves' are allowed, which can be put in place by pressing 60 to 63. During the water flow, valves are toggled on and off using the corresponding function key. A valve is removed by pressing SHIFT plus the function key while editing. If a valve is turned on over some water droplets, they will adopt an acidic approach to the problem and burn through your freshly placed valve!

The program uses very similar logic to that of the original Arc version, with a minor refinement to the upward movement of droplets in a capillary. Much use is made of tables in the plot routine to ensure the maximum possible speed. You might like to add routines for loading and saving screen layouts.

# COLOUR INTERRUPTS

Program: IntDemo

Description: A graphics utility

Author: Dave Acton Machine: 32-bit

Listing: 330 lines of machine

code and Basic

How can you display 1024 colours of your choice in mode 12? Well, the answer lies with interrupts as this IntDemo program shows. The prospect of getting more colours on the



Intdemo programs the mode 12 palette by writing directly to Vidc

screen has long tantalised programmers. Although mode 15 provides 256, you can't choose exactly what 256 shades these are and the palette is tricky to manipulate. No wonder then that many game writers are using the technique of colour by interrupts to increase their palette, and IntDemo is an example of how it's done.

In a sixteen colour mode, like mode 12, you can set the red, green and blue levels of

0	1	0	9	8
3	2	11	10	11
4	5	4	5	12
7	6	15	14	7

In IntDemo dithering - using a chess board pattern - smooths colours between shades

any logical colour to 16 different values, giving 4096 possibilities (16×16×16). change a colour in Basic you use a command like:

COLOUR 4,&40,&50,&60

This is is turned into a sequence of VDU commands which ultimately become numbers poked directly into Vide -

the Arc's video controller chip.

It's perfectly possible to change a logical colour while the Arc's displaying a screen. Colour one might be red at the top, green in the middle and vellow at the bottom. So, although you are still limited to 16 logical colours, the physical colours they represent may be changed part-way down the screen. Quite often a game will have one set of sixteen colours at the top and another set at the bottom.

Our demonstration, Demo, doesn't change the palette once per frame though, but on each and every pixel line. Two important factors must be considered when using this technique.

# Timing and leeway

It is vital that you change the colour at precisely the right moment. In IntDemo the palette is altered 256 times per frame. To do this requires accurate timing, which is achieved by using interrupts from a 2MHz clock (in IOC), and speed, which is achieved by concise routines that poke values directly into Vide. Other sources of interrupts (like the keyboard) are also disabled most of the time so they don't affect the accuracy of our timed interrupts.

Another consideration to take into account is that it is best to give yourself some leeway. Games often have a couple of blank lines between different coloured areas. This is because you cannot guarantee the accuracy of your interrupts. IntDemo achieves a smooth picture by a trick, which we will look at in more detail later on.

To stop IntDemo simply press s and restart it by pressing G. Pressing Escape will halt the program and everything will be restored neatly. If available, the font Trinity.Bold will be used for the demonstration. If not, the system font is magnified and used instead.

A total of 1024 different shades are built up (using a procedure which 'smooths' the transition between different colours) and stored in a table. The colours for particular lines on the screen are read from this table at a point dependent on the current frame count. The colours of IntDemo are symmetrical about the middle of the screen, but of course

you could, in theory, have four unique shades per line, providing 256×4=1024 different colours in total.

# Working details

The IOC chip provides two 2MHz timers - zero and one. Timer one is available to us and IntDemo uses it to judge when to change the palette.

First, calibrate is called to count how long it takes to display eight frames. We do not assume that the timer runs at exactly 2,000,000 ticks per second, so using an event handler, we count VSync events (these occur just before a new frame is displayed) and record the times between them. In the variable each we place the time (shifted left six places) that we expect the display hardware to take to show each pixel line.

The routine doit sets up interrupt handlers for timer one and VSync. Although it is possible to use events and claim the event vector to spot VSyncs, for accuracy's sake we look at the VSync interrupt itself. We set the appropriate bits in IRQMSKA - the interrupt mask A - to enable the interrupts we are interested in.

We also disable other interrupts (including keyboard ones) by clearing bits in IRQMSKB, the other mask. So that ESCAPE, S and G are detected, we enable keyboard interrupts briefly just before a new frame, so we can check for these keys and then disable them again. You can see the effect of unwanted interrupts on the stability of the picture by holding down a key.

When VSync occurs. event\_start is called which clears the VSync interrupt, and places the contents of each (shifted back down) into timer one. The timer is then set counting downwards by writing to its GO register. Now, for every count down of each, an will occur and interrupt event\_swap will be called.

It's event\_swap that changes the palette. First it clears the interrupt condition, then reads from a table of colours (at table) the 12-bit values it needs to place in the Vidc registers to change the palette.

The smoothness of IntDemo is achieved by keeping slightly ahead. Changing all the colours on every line might

# **BEGINNERS' CORNER – LOOPS**

However simple your program, it is very likely that some lines will need to be executed more than once. In other words, you will need a loop. Basic, particularly on the Arc, offers a wide choice of looping methods and it takes practice to decide which sort of loop to use. The simplest, but the least useful is:

10 i=0

20 i=i+1

30 IF i<10 GOTO 20

which counts up to 10 using the variable i. GOTO loops are not 'structured' and should not really be used. Far better to use one of Basic's alternatives to 'wrap up' neatly those instructions that need to be repeated. In cases where you know how many times you want to repeat a section of program, the FOR...NEXT loop is best. To add up the numbers from 1 to an entered value n use:

10 INPUT n

20 total=0

30 FOR i=1 TO n

40 total=total+i

50 NEXT i

60 PRINT total

If you can't be sure how many times your loop must run, the REPEAT...UNTIL structure is often better. For example, when waiting for the user to press Y or N in response to a question use:

10 REPEAT

20 key\$=GET\$

30 UNTIL key\$="Y" OR key\$="N"

The loop may be executed just once or 100 times (if the user is particularly stupid or has CAPS LOCK off) But sometimes even once is too many times. Consider a string a\$ which the user has entered. We might want to strip all spaces from the front of it. A simple loop removing one space at a time would be ideal, but of course there may be no spaces at all. Basic V on the Archimedes provides the WHILE...ENDWHILE structure for such occasions:

10 INPUT a\$

20 WHILE LEFT\$(a\$,1)=" "

30 a\$=MID\$(a\$,2)

**40 ENDWHILE** 

The loop will continue until the first character of a\$ is not a space. If the string entered has no spaces at the start, the loop will never be executed and instead, control will jump to the line after the ENDWHILE. You can simulate the WHILE...ENDWHILE loop on a eight-bit machine by using a boolean variable (one that can be TRUE or FALSE). Here's how:

10 INPUT a\$ **20 REPEAT** 

30 done=LEFT\$(a\$,1)<>" "

40 IF NOT done THEN a\$=MID\$(a\$,2)

Here we've swapped the logic around so done is TRUE if there are no more spaces to strip. REPEAT...UNTIL loops carry on until a condition becomes TRUE whereas WHILE...ENDWHILE loops continue until a similar condition becomes FALSE.

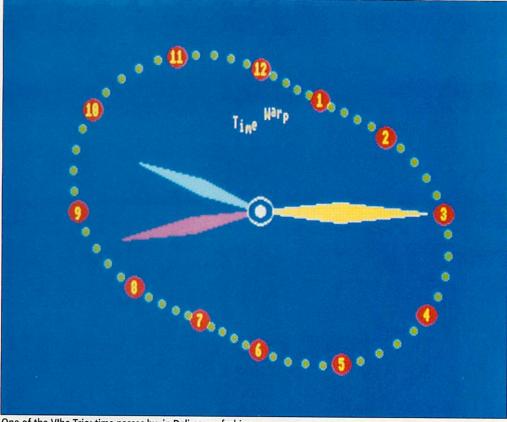
produce some flicker so instead we change only four at a time. The diagram on the left shows the idea. On line 0, only logical colours 0, 1, 8 and 9 are used. Colours 0 and 1 are set to a particular shade and colours 8 and 9 to the opposite hue. Line 1 contains only colours 2, 3, 10 and 11 and so on. When the display hardware comes to show line 0, the colours on it have already been set up. In fact, the interrupt routine will be busy changing the colours on, say, line 3 which is yet to be displayed.

Dithering - mixing colours in a chessboard fashion - also smooths the transition between shades. Each line contains a mixture of logical colours. On line 0 the mixture is either 010101... or 898989... Sometimes colours 0 and 1 will be set to the same hue, but they may also be set to slightly different ones to provide an intermediate stage of shading.

The demonstration screen is produced, using an ECF pattern which takes all the effort out of setting adjacent pixels to different logical colours. When the screen is complete, the circle is coloured using logical colours zero to seven whereas the writing and surrounding area use eight to 15. These are always set to the opposite colours of zero to seven to provide a contrast.

#### Writing to Vide

Changing the palette by writing to Vide is simple enough and the diagram on p62 shows



One of the VIbe Trio: time passes by, in Dali-esque fashion

how it's done. The Vide always lives at address &3400000 and you must be in supervisor/IRQ mode in order to write to it.

To program a colour, build a word as shown in the figure on p61. The zeros must be zero and the Xs are ignored. The logical colour - 0 to 15 in mode 12 - is placed in bits 26 to 29. The red, green and blue intensities - each 0 to 15 - are placed in the bottom 12 bits. Finally, bit 12 is the supremacy bit, which is only used by specialist hardware.

#### VIBE TRIO

Programs: CrazyLet, Dali and Fern

Description: Graphical demos Author: Jan Vibe Machine: 32-bit

Listing: 50 to 80 lines, Basic

This month we have three more graphical offerings from \*INFO regular, Jan Vibe. Fern is a piece of recursive animation. The plant-like shape is created using the procedure PROCa which plots a section of stem and then calls itself to plot the next section as well as the two offshoots. The sub-branches curl around according to the angle t and so several frames (24 in all) are plotted with slightly differing angles to provide you with a short 'movie'.

Each frame is stored in a sprite block spr and you will need about 500K of Basic workspace to run the program. As with many of Jan's programs, screen swapping is used to remove flicker.

Crazylet is another piece of animation, but it works in real time. Again two screen banks

are used for smoothness, and the different-sized letters are produced using the VDU 23,17,7 sequence that we've seen before in \*INFO. For more details, note that Crazylet is the subject of this month's Line by Line box.

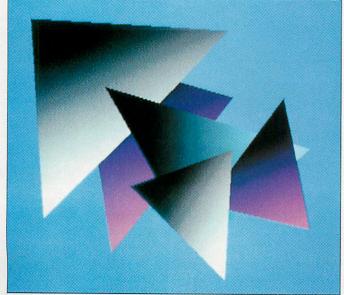
Finally, I need say nothing about Dali (shown above) except that it is a computer-art joke. Hope you like it!

#### **GOURAUD SHADING**

Program: Gouraud Description: Graphic utility Author: David Walters Machine: 32-bit Listing: 90 lines of Basic

Gouraud's shading technique has long been used to colour 3D images smoothly and this short demonstration by David Walters shows how easy and effective the method can be.

The technique is applied to triangles, whose corners are of known intensities. David's program first calculates the intensity of each point on the bounding lines. Then, working down the image, it fills in each pixel row with a smooth progression from the intensity of one side to that of the other. David says: 'To make the shading appear even smoother,



Gouraud shows you how to get smooth 3D shading in your Beeb programs

# THE DRIVING FORCE



Standard Driver

521 seconds

A complex page of text & graphics 2 pages text in different fonts

One complex page from !Draw

TurboDriver
Time to
complete

199 seconds
283 seconds
261 seconds

Time to get control back

70 seconds
64 seconds

All times in seconds from a standard ARM2 Archimedes with 4MBytes RAM and hard disc. Times would be faster for an ARM3 based machine.

BJI 0ex printer & drivers £249.00 + VAT (£292.57) + p&p. Optional 30 sheet feeder £48.00 + VAT (£56.40)

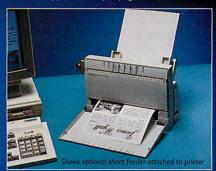
TurboDriver software & printer cable £49.00 + VAT (£57.57)

Compatible with all applications that use the RISCOS printer drivers and all Archimedes models.

Winner of the Best Printer in the recent Computer Shopper Awards, the Cannon BJ10ex printer has revolutionised the small printer market. It offers 360 dpi, near laser printer quality, on plain A4 paper, in an incredibly compact and lightweight housing. Unfortunately the existing RISC OS printer drivers, based on the standard Acorn drivers, have definitely been in the slow lane, locking your computer up for the entire print process, often up to ten minutes per page.

Computer Concepts have now created a set of RISCOS printer drivers, called TurboDrivers, that are optimised for the Cannon BJIOex printer. The result is the perfect combination of budget printer and RISCOS printer driver, able to print full 360 dpi high resolution pages at a quality superior to that available from any dot matrix printer.

The TurboDrivers not only print the pages faster, but give control back sooner - up to ten times quicker. The table shows the time taken to print and the time the computer is occupied for some typical example pages.



The TurboDrivers print faster on an ARM2 machine than traditional drivers on an ARM3 machine. In addition they can send the print data to disc and then print from disc in the background, so the computer and almost all memory remains free for other uses, while the printer gets on with printing.



Computer Concepts Ltd

I used a simple error-spreading algorithm. The error of each pixel is the amount by which it differs from the nearest available plotting intensity.

'These differences are added together sequentially, and when they are greater than the current intensity step, one pixel of the next intensity up is plotted and the size of that step is taken away from the error.'

Gouraud just plots random triangles on the screen but as David points out, 'The technique is useful for the smooth rendering of 3D objects (like space shuttles, VW Beetles and teapots).

The triangles that make up such objects are specified by the three points and their respective intensities. In a 3D objects, these intensities would be calculated by averaging the planar intensities of every triangle associated with those points.'

#### **BEEB COLOUR**

Program: BBC-DLI Description: Graphic utility Machine: 8 bit, BBC B only Listing: 200 lines m/code

A special this month for BBC users, from Tristram Mabbs, is a summary of an article that first appeared in BAU in 1984. It demonstrates Display List Interrupts - a technique that allows more than the usual number of colours to be displayed on the screen at a time.

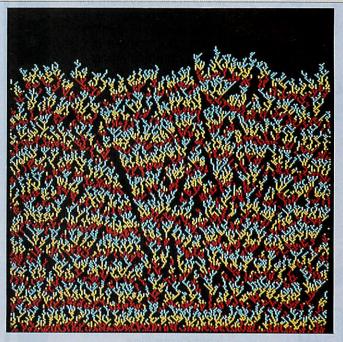
When the BBC first appeared, many people were amazed at its ability to display resolution graphics (Mode 0) as well as having a large number of colours available. Unfortunately, a few weeks later, the very same people were also amazed at how little memory they had left. Of course, in these 32-bit days where the word megabyte has almost replaced kilobyte,

#### ONE LINE CORNER

Programs: Chaos, Weed, MarsScape, GasPlanet Description: Graphic demos Authors: Matthew Godbolt, Richard Talbot-Watkins, Peter Machine: Chaos, Weed: all machines; MarsScape, Gasplanet: 32-bit only Listing: One line Basic

One line corner this month offers a selection of programs. some silly, but all clever and written in a single line of Basic. We have a couple of one-liners from Matthew and Richard. The first is entitled Chaos and closely resembles Duncan Lilley's MicroArt program from the March 92 issue. There is no zoom option available, but the program tries to scale the image so that it will fit onto the screen by running the algorithm for 100 dots without plotting anything this will give a rough idea of the final size. When run, you are required to enter three numbers between -2 and 2. As an example, try your birthdate (.13, .12, .1967) or a phone number (.071, .490, .1444).

The second one-liner, shown above, is called Weed, because it draws, er, weeds. It produces a remarkably similar effect to B Moseley's Frond program from October 91, but in one line of Basic rather than umpteen lines of code. There are 256 columns of pixels and each are allocated



a byte which contains the maximum height reached so far. The program chooses a random column and, depending on the height of the neighbouring columns, a point is placed either above, diagonally left or diagonally right. Every 512 dots, the colour is changed, resulting in the multi-coloured weed effect.

Peter Warden's striking MarsScape and GasPlanet one-liners are based on a variation of the Browning line (or Brownian curve as it is sometimes called). Peter explains: 'Basically a Brownian line is constructed by creating a pair of axes, x and y, and setting a value p

to 0. You plot this point at 0,p on the graph, add a random value between 1 and -1 to p, and replot at 1,p. Continue this until you reach the end of the y-axis.

'In the case of MarsScape I've modified this by introducing another axis, z. The value of p is calculated by adding the mean of the values of p at the points z-1,x and z,x-1 and adding a random value between 1 and -1 to p. The value p is then used as the colour of the pixel(z,x). GasPlanet is the same as MarsScape except the surface has been mapped onto a sphere.'

we often forget what it was like back then. I'm writing this text in Mode 31 on an A5000 which takes up over 230K more than seven Beebs worth.

But at that time, you could either resort to Mode 7 (limited graphics, but lots of colours and only 1K used) or purchase a second processor or shadow Ram board. Other computers at the time used a variety of techniques, the Spectrum had a bit-mapped screen for the actual pixels, but used a character-based map for colours. This meant that it could display relatively high resolution mono graphics, but was limited to only two colours per 8×8 block.

The old Atari range (400 and 800) used what they dubbed Display List Interrupts; a similar, but vastly improved, technique is employed by the Copper chip in the Commodore Amiga. This method involves redefining the colour registers during a scan of the screen. This may sound rather complex but fear not, application is relatively simple. There are disadvantages: you cannot cleanly redefine a colour while it is being displayed - it tends to flicker and the processor interrupt overhead is increased, slowing the machine down a fraction.

Two interrupts are trapped firstly the vsync interrupt, this happens at the start of a screen scan. At this point, all colours are reset and a timer is started. After a given count is reached, we know how far down the screen the scan has reached and can change the values of the colour registers.

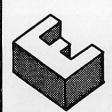
Before going any further, a brief explanation of the video controller will be useful. We cannot use the nice convenient VDU 19 method of changing the palette as it takes far too long. The video controller has two registers that appear at &FE20 (control) and &FE21 (palette). The palette consists of two 'fields'. The top four bits are an address, the bottom four bits contain a physical colours EORed with seven. Thus a

#### **CRASH COURSE TWO**

This month we have a short update to Crash Course, found in \*INFO November 91, which talked about some of the features of Risc OS. Stephen Burke has sent a tip on desktop start up files. Many boot files or obey files passed using the -file option after \*Desktop will contains lines to initialise the system resources, fonts and so on. Sometimes these will be on filing systems other than ADFS, like SCSI. Confusion can arise because under certain circumstances the filing system name is stripped off. Take the line: SCSI::Winnie.\$.!System

which might be included in an obey file to set SystemSPath etc. The SCSI: will be stripped off by the CLI. The solution is to use \*RUN:

Run SCSI::Winnie.\$.!System



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#### LINE BY LINE: CRAZYLET

By special request, \*INFO now has a new section. Each month we'll be taking a look at one of the \*INFO listings line-by-line as an aid to readers who want to improve their programming skills. Our first example is the 32-bit demonstration, CrazyLet, by Jan Vibe, one of the Vibe Trio described on page 63.

60 Select 256 colour display mode 13

70 Set up string to display 'crazily'!

80 Declare arrays. These hold information about each crazy letter. Every letter has an x and y angle, in a1%(), a2%(), and a rate of change of angle, in t1%(),t2%(). The x and y size of a letter, in xz%(), yz%(), are calculated from the angles. Finally c%() holds colours of letters 90 Assign number of letter to 1%

100 Set s1% and s2% to screen bank numbers 1 and 2

120 FOR...NEXT loop to randomise details of letters

190 Allow text to be displayed at graphics cursor

200 Switch the cursor off

210 If an error occurs (including ESCAPE) select the current screen bank, report the error, switch the cursor back on and stop

220 The main loop begins

230 Set x% to 320 - the number of pixels across the screen. We are about to calculate the width of the displayed string, so we can centre it

240 Change a randomly selected letter to a new random colour

250 The loop to update the details of the letters

260 Update x angle of a letter and keep in range 0-359 degrees

270 Update y angle similarly

280 Update x size. The size is dependent of the x angle and Sin is used so the letters grow and shrink in a smooth cycle

290 Update y size similarly

300 Subtract the x size in pixels from the running total

310 Next letter

320 x% is set to 2\*(320-total width of message in pixels) = 640-2\*width. Because each pixel is 4 OS units wide, plotting the string starting at 640-2\*width will ensure it is centred

330 The loop to plot the letters begins

340 y% is set so letter is vertically centred

350 MOVE to where the letter is to be displayed

360 Set the text size to that of letter n% using VDU sequence

370 Select the letter's colour

380 Print the letter

390 Move x% on by the width of the letter

400 Next letter

410 Wait until VSYNC - this is to reduce flicker

420 Select screen s1% for plotting on

430 Select screen s2% for display

440 Clear screen s1%, now 'hidden', ready for next plot

450 Swap s1% and s2%

460 Carry on indefinitely

value of &x3 would be colour four (three EOR seven). In 16 colour modes, the address corresponds directly to the logical colour numbers. In two colour modes all of address zero to seven must be programmed with the same logical colour for physical colour zero.

Likewise, all of eight to 15 correspond to physical colour one. In four colour modes, there is more complex. Colour zero is controlled by addresses &0x, &1x, &4x and &5x, colour one by &2x, &3x, &6x and &7x, colour two by &8x, &9x, &Cx and &Dx and colour three by &Ax, &Bx, &Ex and &Fx. All you need do to run the program is to set up a list of times and palette changes and call PROCset\_dlis. The list consists of three byte entries terminated by three &FFs. An entry is made up from a two byte timer value a single byte to write to the palette register.

If you know anything about machine code and interrupts, then the code should be fairly self explanatory. If you don't, then try not to think about it just run it!

Two other procedures are provided, PROCdlisoff and PROCdlison, to disable and re-enable the DLIs respectively.

#### AS EASY AS ABC...

Program: ABCdir **Description:** ADFS utility Author: Nick Craig-Wood Machine: 32-bit Listing: 50 lines, Basic

ABCdir is a short utility to restamp all directories with the current time. This allows desktop filer windows to be sorted by date, but effectively have directories sorted by name.

Desktop filer windows can by sorted in four ways; by name, type, size or date. Most people use either name, to put their files in alphabetical order, or date with the most recent files near the top of the window. The disadvantage of date sorting is that directories will tend to migrate to the end of the list because, once created, their time-stamps are never updated. Files, on the other hand, are re-stamped when they are re-saved, making it easy to pick out the most recent version.

Nick's program gets round this problem with a rather cunning stunt. When sorted by date, any objects with the same time-stamp are alphabetically. It works by going through the directory tree, starting at the current directory (by default), and date-stamping all the directories it finds with the current time. Of course the current time is only read at the start of the program, otherwise it would change for stamping.

This has the effect of making the filer put all the directories at the top of windows (because they have all been restamped) in alphabetical order (because they all have the same stamp). Application directories which have a !RunImage file are affected, because the directory is shown with the time and date of the !RunImage file rather than its own. After you run the program, you have an added bonus: any newly created files will be shown 'above' the directories, making them very easy to spot.

#### **OVER TO YOU**

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\*INFO, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London, N1 6DI

#### TIP OF THE MONTH

Have you ever pressed Control Break on your Arc only to find a 'Bad program' error when you type OLD? As long as you weren't doing anything clever with machine code then the chances are that you can still get your program back.

This situation is most likely to arise if you dropped out of the desktop with F12 and entered Basic. Because the operating system handles its memory in pages, pressing BREAK (or RESET) is quite likely to shuffle all the memory around, so although if you print the value of PAGE, you'll be given the same value, the physical chunk of memory allocated to Basic may have moved. The simplest way to attempt recover is to type in the following single line straight away.

FOR I=PAGE TO HIMEM STEP 256:IF ?I=13 AND I?1=0 P.7;:N. ELSE N.

This will step through memory 256 bytes at a time eventually crashing out with an error (which can be safely ignored). The values it prints are possible start points for your program. If you write them down, or better still, print them out, then set PAGE to each one in turn and attempt to LIST. Often you will get 'Bad program' just ignore this and move on.

Sometimes you'll get valid Basic programs, occasionally these will be just sections rather than complete programs, when you find a full program save it as Temp1 or something and continue on. Once you have found all possible programs check them all carefully to see if one was your lost listing. Keep a look out for old versions which may still be lurking in memory!



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f you have developed a taste for the C programming language – a state of affairs that was hopefully achieved in last month's article - then you will no doubt want to see how this versatile language can be put into action. C is well suited to programming in the desktop environment and this month we look at Timely a complete RiscOS application.

Timely is a useful program in its own right, so let's take a look at how it is used, before we explain how it was written. Timely is a time planner that can be used on a daily, monthly or yearly basis. Next month we will add some new features, but all of the basics are provided in this month's listing. If you are a subscriber, you can load Timely from your monthly disc. If not you need to copy in the program from our yellow pages and compile it. Then double-click on Timely to install it on the icon bar and click on the icon to bring up the current year planner. You can bring up any day by double-clicking with Select. Alternatively, bring up a month by double-clicking with Select on its name. On a month viewer you can bring up a particular week by double-clicking above it.

Appointments are shown by coloured stars followed by a message. On the year and month planners there is only room for the stars, but these are colour-coded so you can easily spot birthdays, meetings, deadlines or whatever. To add an entry, simply bring up the appropriate day and double-click on it with Select. Enter the message, select one of the eight colour-coded types and click on OK. To alter or delete an entry, double click with Adjust instead. You can use the Next and Last buttons to browse through the diary to find the desired entry.

You can bring up a menu over any Timely viewer. To save all entries use the Save Whole Diary option. The default option is to save it as Diary in the Timely directory, but you can save it elsewhere. You can save just the current viewer as text, or a Draw file with the other menu options.

#### **HOW TIMELY WORKS**

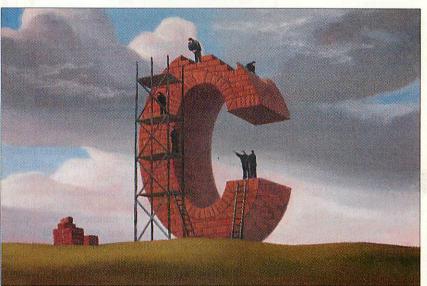
An application in C is like any other program, in that it has a function main() which marks the start of the program. The main in Timely is typical of C applications and is only five lines long. First,

#### PROGRAMMING ADVICE

Desktop programming can be awkward. Odd parts of your code may be called at odd times. In order to ensure that all the components interact successfully, note the following two points.

Firstly, global variables can be used so that different bits of your program can access the same information, but only use them if there is no alternative. Local variables are infinitely better as they make for less disjointed code.

Secondly, handles can often be passed to handlers. These are often void pointers (with case void\*) and can be recast as necessary. Timely shows how they may be used effectively. When you save a viewer as a Draw file for example, the number of the viewer (an integer) is passed to the Save procedure, which uses it to save the correct diagram. Global variables can do the same job (save\_mode is a real example) but use them sparingly, if at all.



ANGUS MEWSE

timely\_initialise is called, which attempts to initialise all the libraries, create menus and windows whose definitions do not change during the life of the application, and set up various global variables. If initialisation is successful, the main routine enters an endless loop that is called event\_process.

Control at this point is effectively taken away from us. We have set up handlers in the initialisation routine to deal with events, menu selections and the like. These will be called if the user needs to do anything.

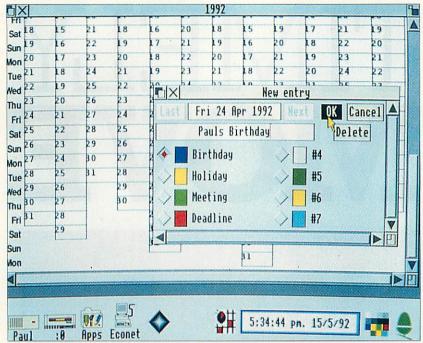
This month we are going to focus on the libraries used by Timely, looking at C.Userlib, C.Memory and C.FontUtils.

#### **FONTS**

C.FontUtils consists of routines to declare and manage fonts. A structure font\_desc, which I introduced last month, forms the basis of font management. Where you need a font in your program, declare a variable of type font\_desc and pass it, with the desired font name and size to font\_utils\_declare\_font. This will call the appropriate routines from the Risc OS font library to locate your font and fill in the other fields in font\_desc.

A secondary routine called font\_utils\_verify\_font tries to track down the particular font you asked for, substituting the nearest it can find. You might want Alfred.Bold but an error box will be shown if this is not available and Trinity.Bold might be used instead.

In the second part of our series on C programming, Dave Acton presents a time-manager application



Entering those all-important dates into the Timely application

#### **DIRECTORY PLAN** \$.!Timely.!Boot !Config !Run !RunImage !Sprites c. Timely Diary Make MakeFile o. Timely Sprites Templates \$.Library... \$.Risc\_OSLib... \$.UserCLib.c.drawutils fontutils memory userlib wimputils h.drawutils fontutils macros memory userlib wimputils o.drawutils fontutils memory userlib

wimputils

Applications often need to be able to select fonts from those available. There is a Risc OS library called FontSelect which provides a selector window. However, many applications - Impression for one - use menus as a more convenient method. The major font families appear on a menu (Trinity, Corpus and so on) and fonts within those families as sub-menus (Trinity.Bold, Bold.Italic, Medium and so on).

C.FontUtils provides two routines to allow this: font\_utils\_menu takes a title string and a font\_desc pointer as arguments, returning the handle of a menu structure. This contains a menu of font families as well as x and y fontsize menus. The menus will be ticked appropriately for the font in your font\_desc structure. You may have more than one font that needs changing (as in Timely) and you may therefore use font\_utils\_menu several times to append different font menus to your overall menu tree. When the user selects something from the menu, control is passed to your menu handler.

This should, in turn, detect that the user has selected a new font or size from a font menu. In this case font\_utils\_menu\_select can be called, passing to it the tail of the hit[] array that describes the user's menu selection and the font\_desc variable appropriate to the font being changed.

This will update the font\_desc block and return TRUE or FALSE if the font was changed in any way. If it was, you can redraw any windows in which the font is used. The routine font\_utils\_tickmenu provides a means of reflecting the currently chosen font and size in a font menu without recreating the whole menu structure (if for example, the user clicks with Adjust on a new font size and the menu remains open).

#### MEMORY

Another library that could be useful in many applications, is *C.Memory*, that provides extra memory management routines. In standard C, malloc is used to grab some memory, free is used

to release it when no longer needed. Risc OS, being flexible, can allocate more memory to an application when it is needed or take some back when it is not. To fit in with this flexibility the flex library is provided. A flex block is like a block of memory allocated with malloc, except that it may be shifted about so that no memory is ever wasted

You may well wonder how to find the allocated memory? Well, each flex block has an anchor - an integer variable in fixed memory (in other words not in a flex block) which contains the address of the memory block. Whenever you need to refer to the memory, you look up the address in the anchor, which may have changed since you last referred to it. When talking to the flex library you always pass the address of your anchor (cast to flex\_ptr). Using flex blocks can be tricky at times - you must be careful not to make a copy of the anchor and use it in situations when the anchor may have changed, for example:

char \*p=(char\*) anchor; flex\_realloc((flex\_ptr) &anchor,size+42); strcpy(p,"Hello");

In this case, anchor may be shifted by the flex\_realloc and you may be copying the string "Hello" into hyperspace!

Claiming and releasing memory can take time, so it is useful to have a block of memory that goes up and down in chunks (say 1K each) rather than in individual bytes. C.Memory provides such a facility with its own structure memory block. This contains an anchor, like a flex block, a size and a used field which reflects how many of the currently allocated bytes are physically in use. It is up to the user to ensure this

#### YELLOW PAGES

Timely can be obtained from yellow pages and was written using Acorn C (release 3). To compile the source, which comes in several parts, you will first need to ensure you have all the relevant files in all the correct places. The box opposite shows the plan. Filenames in bold need to be entered by you. Those in italics will be created by the MakeDat program. Remaining files will be compiled for you.

Files are to be placed in two directories - the Timely application directory which, for simplicity, I will assume is in \$, and UserCLib which I will also assume is in \$. If you want to relocate these, you need to adjust makefiles and so on accordingly. The source of the main application is \$.!Timely.C.Timely but because many of the routines may be useful for other applications, I have included them as separate files in \$.UserCLib. They appear in full in the C directory there, and also as header files in the H directory. One file of useful macro definitions appears in H only (and not in C since it contains no real code). You will need to enter both the C and H files.

The make file for Timely will assemble all the components and link them with the main application to produce the file !RunImage. Simply go into !Timely and type \*Make. The MakeDat program creates all the files that are otherwise unlistable (sprites, templates and so on). Enter this and run it inside the !Timely directory. You may, of course, like to save yourself some typing and wait until the final version next month. Although the main source code will be enhanced, the libraries will not change.

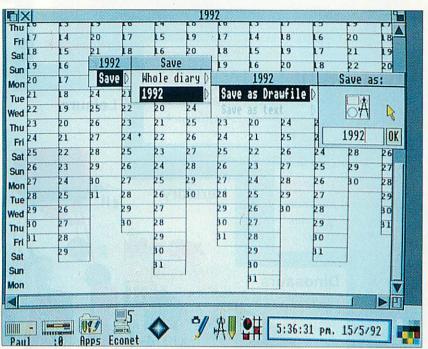
field is set correctly. Such a block can be initialised with init\_memory\_block, which takes as one parameter the chunk size. Whenever the block needs to be extended or reduced it will be in multiples of this. Then ensure\_memory is used to allocate a number of bytes to a memory block (rounded up to the nearest chunk) and the current allocation will be extended or shrunk accordingly. One routine, ensure extra memory, is particularly useful as it makes sure that there are a number of extra bytes free, beyond those currently used. Often this call will return without needing to extend the block.

If you were to write a wordprocessor for example, where the text were stored in a memory block which was extended by one byte with every letter typed and reduced by one byte with every deletion an inordinate amount of time would be spent shuffling memory. Instead, the memory block could be declared as being in 1K chunks so only every 1024th character typed would cause the block to be stretched by 1K.

Memory blocks are used by Timely to store each viewer as a Draw diagram and by C.DrawUtils which uses one to store an individual Draw object before it is added to a complete Draw diagram.

#### AND THE REST...

C.UserLib is made up of several miscellaneous routines. At the moment only one routine is included, userlib\_strcmp, together with a general form of the same routine, userlib\_genstrcmp. The former takes two strings, which may contain the wildcards \* and #, and compares them. Case is ignored, but userlib\_genstremp takes an extra parameter which should be FALSE if case is not to be ignored. The routine will be used directly by Timely next month to look for specific birth-



Saving a Timely set-up as a Draw file

days and other diary entries. Also, the routine is used by C.FontUtils to find the closest font to the one requested.

Finally, the C.DrawUtils, C.WimpUtils libraries provide routines to create and manipulate Draw diagrams and to ease the use of the Wimp libraries. They are used extensively by Timely and will be described in detail in the last article of this series. Meanwhile take a look at our book review below. It could put you firmly on the road to C mastery.

C you all, same place, next month.

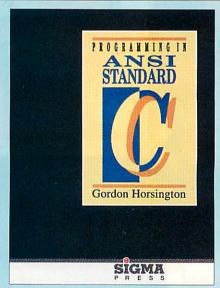
#### BY THE BOOK

#### PROGRAMMING IN ANSI STANDARD C **Gordon Horsington Published by Sigma Press** Price: £14.95

We mentioned in the first part of this series that it was a good idea to invest in a book. Although this series is intended to give you an idea of how to impelement C on your Archimedes, it is not possible to cover absolutely everything.

So, with this in mind, we chose to look at a book from Sigma Press which represents a comprehensive introduction to Acorn C. This type of C, like the MicroSoft C on the PC, conforms to the Ansi standard.

An early chapter compares Basic with C, using many short examples in both languages, which will be valuable to those who have a understanding of Basic but want to branch out into C. Subsequent sections explore in logical progression the features of C from the preprocessor right through to structures and file handling. The book has a reliable and consistent feel - important for any guide that is designed for newcomers. Examples are the key method of explanation and make a refreshing change from unfriendly syntax tables.



But, learning C is of little use usless you can use this knowledge to tackle real problems. Techniques are included in the book, linked lists are described in the section on data structures for example, but they are perhaps a little thin on the ground. Although you could develop a sound understanding of C's syntax,

it might take a more advanced book to show ex-Basic programmers the new possibilities

The programming examples, although plentiful, in some cases could be more wisely constructed. I suppose all authors must find a balance between simplicity and usefulness. For example, the rule, 'only use recursion if it improves the efficiency of a program,' is quite rightly given, but broken on the previous page by an example which calculates factorials recursively!

As with any review of a book about a standard language like Ansi C, it is much easier to pick holes than show benefits. Plus points invariably come down to how well the author explains things and Gordon Horsington's explanations are very clear indeed.

It would be unfair in a review this size to let my fairly minor reservations about the book mar the picture of what is a soundly written and well-organised introduction to Ansi C. A bonus is that it also contains specific advice for Archimedes users.

This guide covers the groundwork more than adequately and I doubt whether the 250odd pages could be more effectively used with the new C programmer in mind.



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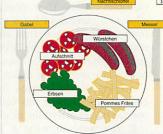
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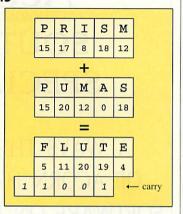
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#### PUZZLE PAGE



#### £25 PRICE WORD SUMS

If we number the letters of the alphabet starting at 0 (A=0, B=1, C=2...Z=25)we can represent words in base 26. For example, CAB=(2\*262)+(0\*26)+1=-1353. If we add the values of two words together, we occasionally form new words. The figure shows one example: Prism + Pumas = Flute. Note that we ignore the carry from the P+P to give us a five letter answer. Now consider the word Clank. There are



two five letter words whose values added together in the way just described produce the answer Clank. The prize puzzle is to find these two words.

To make it a little easier, here are three clues. Firstly, the two words share the same last two letters. Secondly, the two words each contain only one vowel. These vowels are different and occupy different places in their respective words. And finally, the two words are connected in meaning.

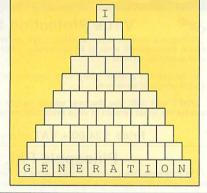
When you have found the two words, write them on a postcard or piece of paper with your address, marking it July 1992 Prize Puzzle and send it to: BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. The closing date is Friday 10th July 1992.

#### **PYRAGRAM**

Consider this pyramid. Starting with I at the top, add one letter to each row and rearrange the letters you have to form a valid English word. At the bottom you should be able to form

Generation. To make it easier, there are clues for the eight intermediate stages, although these are in no particular order:

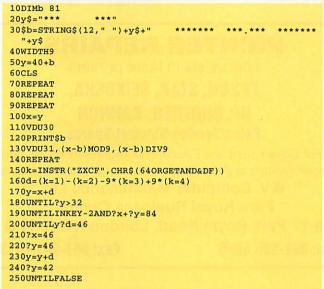
- 1. Draw
- 2. Going in
- 3. The thing
- 4. Confine
- 5. Passive
- 6. Orange 7. Hiring
- 8. Grow weary



#### **SOLITAIRE**

Here's one of our famous one-liners for those who like such things. It's a version of the classic one-player game. Use Z, X, C and F to move the cursor. Press Ctrl with these to jump one peg with another. As you'll know, the object is to end up with a single peg in the middle of the board. The game is best entered on several lines and squashed using our regular function key squasher as shown. (Type in the listing, enter the function key definition and press f0).

By the way, be careful to get the right number of spaces and stars in line 30. The string in quotation marks has four spaces at the start and end.



```
*KEY0 f=PA.+4:t=f:b=&F5:REP.c=(b<>&F5):?t=-?t*NOTc-
c:t=t-c:x=f?-1:FOR i=1TOx-
4:b=?f:?t=b:f=f+1:t=t+1:N.:f
=f+4:U.f?-3=&FF:?t=&D:t?1=&FF:?(PA.+3)=t-PA.|M
Function key definition to squash listings on to one line.
```

#### SYNONANAGRAMMATISATION!

Each of these words has three synonyms - words with similar meanings. These synonyms have been scrambled to form new words. Can you unscramble them?

OPEN: TROVE, BRAILLE, BINGE

PRONOUNCE: PEAKS, AGONISED, MEDICAL PEERS: SQUEAL, SINECURISTS, LASER SEPARATE: SPILT, ROYALIST, SERGEANT BANDS: SITE, CLERICS, DISCONSOLATE

#### SIX APPEAL SOLUTION

The solution to May's prize puzzle is given below. The winner is M A Aldridge of Derby.

S	T	0	C	K	S
T	Y	R	A	H	T
0	R	A	T	0	R
C	A	T	T	L	E
K	H	0	L	L	S
S	T	R	E	S	S

#### JUNE'S SOLUTIONS

#### A little sum-thing

The value of D4 is 4. To make D4 zero, change A1 to -3.

#### **Keyword search**

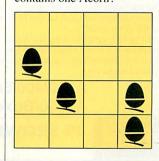
AND, ABS, ADVAL, BGET, BPUT, COLOUR, CALL, CHAIN, CLEAR, CLG, CLS, COS, DATA, DIM, DRAW, END, ENVELOPE, ELSE, FOR, FALSE, GCOL, INPUT, MOVE, NEXT, OPENIN, PRINT, PLOT, REPEAT, READ, REM, STEP, SIN, SOUND, STOP, TAN, THEN, TRUE, UNTIL, VDU, WIDTH.

#### Vowel trouble

TP=UTOPIA, RP=EUROPE, GN=IGUANA, CC=ACACIA, NS=NAUSEA, NS=UNEASE, RL=AERIAL, QT=EQUATE, LS=LIAISE, DN=IODINE, BG=BOOGIE, LG=LEAGUE.

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Can you divide this grid into four identically shaped pieces so that each piece contains one Acorn?



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In our first article on the Arm processor we issued some dire warnings about what it could and could not do. As you may remember, we told you that you have to do without all those useful structures that high level languages, such as Basic, can provide. No convenient statements, such as FOR, NEXT, CASE, REPEAT and so on, can be found in Arm code.

Before friendly languages such as BBC Basic appeared, nearly all languages were based on the machine code of the processor. The modern Archimedes' Basic 5 bears little resemblance to the original Basic of long ago. But, even in those days, you had commands such as PRINT, INPUT, GOTO, GOSUB, IF and, in most cases, FOR and NEXT. Just about any modern day 'structure' could be emulated; it just required a little thought and a dramatic reduction in the readability of your program. Some modern assembly languages do provide high-level commands these are the so-called Ciscs, or Complex Instruction Set Computers. With the Arc we are, of course using a Risc, or Reduced Instruction Set Computer and we have to use more basic techniques.

Most of the structures we are used to are based on comparisons (IFs) and branches (GOTOs), so this is a good place to start. A branch in Arm code must win the award for having the simplest (and shortest) mnemonic – the letter B.

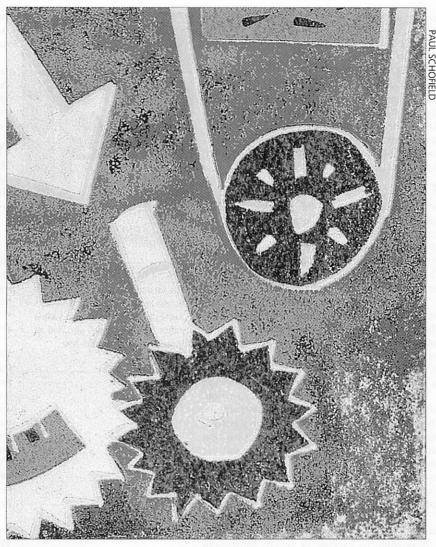
B for Branch; what could be easier! The instruction takes one parameter – the location to branch to – and this is the same as the line number after a GOTO. The location will normally be the name of a label (prefixed by a '.') elsewhere within the program. Our example listing, *ArmI*, is not the most sensible program ever written, but I hope it demonstrates the point.

1Ø REM >ARM1 2Ø REM By Dave Lawrence 3Ø REM For 32 bit machines 4Ø REM (C) BAU July 1992 6Ø DIM code 1ØØ 7Ø link=14 8Ø pc=15 9Ø FOR pass=Ø TO 2 STEP 2 1ØØ P%=code 11Ø [OPT pass 12Ø .branchtest 13Ø B label2 14Ø .label1 B return1 15Ø .label2 B label4 16Ø .label3 B return2 17Ø .label4 B label3 18Ø .return1 19Ø MOV RØ.#1 2ØØ MOV pc,link 21Ø .return2 22Ø MOV RØ,#2 23Ø MOV pc,link 24Ø INEXT 25Ø PRINT "Press SPACE to run code";

26Ø IFGET

In addition to branching, the other component is comparison. The Arm provides four ways to compare and test numbers and the first one we

27Ø PRINT "Returned with"; USR(branchtest)



# 

Dave Lawrence introduces you to loops and conditions

will look at is called CMP, short for CoMPare. Anybody familiar with the 6502 will recognise this instruction. and its use is very simple. For example, if you wanted to see if R0 contained the value 10, you would use the instruction

CMP R0,#10

You should apply the same rules to the right hand operand, as you do when using ADD, SUB, and so on. You are allowed any constant that can be stored in Acorn's 12-bit notation, or a register with an optional shift. All the following are valid:

CMP R1,R6

CMP R5.#&FF00

CMP R0,R1,LSR #16

CMP R1,R4,LSR R10

This is not, in itself, very useful. It's a bit like saying: IF count=10. What happens when count is 10? At the moment nothing, because we don't have a THEN. In fact, what happens when count is not 10? This is where things get tricky, as there is no direct translation for THEN.

What CMP does is to set the processor's condition flags. You already know a bit about the 'carry flag' in connection with some of the advanced shift operations. There are eight flags in all: four system flags and four result flags. The system flags are beyond the scope of this series, so don't worry about them.

The result flags are more useful, as they show the result of many operations, including CMP. These flags are called: Negative, Zero, Carry and Overflow. After a compare, these flags are set according to the result. They can then be examined, either singly or in combination, to tell us if count was, indeed, equal to 10.

The THEN is not translated as one instruction, but included within the following instructions. This relies on a useful part of the Arm's design, that of conditional execution. Any instruction can be followed by a condition code and the instruction is only executed if the status of the result flags are appropriate to the condition code. Now this may sound like a lot of jargon, but what it all boils down to is this.

If you set the processor's result flags to certain states (with an instruction such as CMP), it is possible to execute or ignore subsequent instructions, and alter the linear execution of the instructions in memory. All this theory can be illustrated with a simple example:

CMP R0.#10

BEQ label1

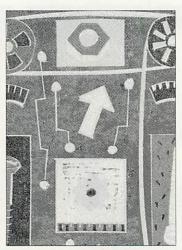
This translates to if R0 = TEN THEN GOTO label1. The if comes from the extra EQ after the B, where EQ is short for equals. The opposite to EQ is called NE or Not Equal. Obviously this will be true if the parameters for comparison are not the same. A sensible example is now possible, such as

CMP R1,R2 MOVEO R1.#0 ADDNE RI,RI,#1

Here, if R1 is the same as R2, then R1 is set to 0, (the MOVEQ) otherwise R1 is incremented by one (the ADDNE). Note that we have added the condition codes to the MOV and ADD instructions and, as a result, made their execution conditional on the result of the compare. This is one of the best features of the Arm. Very few processors can do this.

You are unlikely to need to know about all of the result flags. Although they all have logical connections with their associated results, these are not always obvious. For example, the EQ condition is true if the zero flag, Z is set.

We are now in a position to start simulating some Basic structures, and we will start with a FOR NEXT loop without a STEP. We know the



#### YELLOW PAGES

The second two programs mentioned in this tutorial, Arm2 and Arm3 can be copied in from yellow pages. Subscribers will also find all three programs on their free monthly disc.

loop entry conditions, how many times it will be executed and what the value of the control variable will be at any point.

When translating this to Arm code, we will need to set aside a register for our control variable, initialise it at the start, perform the operations needed within the loop and finally increment the control register and loop back if we have not reached the TO value.

#### TYPICAL LOOPS

The program Arm2 (found in yellow pages) shows how a typical loop might be coded. This piece of code is a direct translation of the following lines of Basic:

FOR i=1 TO 10

PRINT "\*";

NEXT

Have a look at the listing in yellow pages in more detail: line 130 initialises the control register to 1, line 140 defines a label for the main body of loop. Line 150 is an operating system call that prints a star - but don't worry about this for the moment.

Line 160 adds one to the control register, line 170 compares it to 11. But why 11? Well, in a FOR loop, the control variable takes all values between the = value and the TO value inclusively. So our control register must start at one and finish by going through the loop with a value of 10. Therefore, after we increment it, it will have a value of 11. Line 180 is the conditional branch that takes us back to the label loop if the control has not yet reached 10. As always, MOV pc,link is used to return us to Basic. It would be perfectly acceptable to change the last two lines to:

MOVEQ pc,link

B loop

This would be interpreted as: exit if the loop has finished, otherwise loop back. However it is best to keep the code as obvious as possible; starting at the top and finishing at the bottom. There are a couple of ways of making the comparison with one-greater-than-the-end-value less confusing in the code. The first would be:

.loop

SWI 256+ASC"\*"

CMP R1,#10

ADDNE R1,R1,#1

BNE loop

MOV pc,link

In other words, do not increment the control register (and branch back) once the control variable is equal to 10. (Note that it is quite legal to have more than one conditional instruction in a row.) The other method, which is closer to the way a 'real' FOR NEXT loop works is to branch back if the control variable is less than or equal to the control variable. This can be done using one of the other condition codes, LE or 'Less than or Equal'. To try this out, change the following lines:

170 CMP R1,#10

180 BLE loop

This gives a more obvious end value, and the loop runs with all values from one to 10, then stops when it reaches 11 which is not less than or equal to 10. To finish off this month, have a look at the program Arm3 and try to work out what it does, before you run it.

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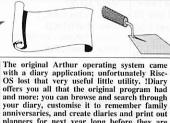






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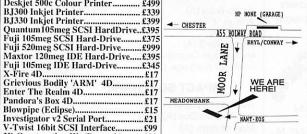
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		B+	128	128	Compact		Turbo			Ram A3000/A5000	disc
Wired for Sound	62				7/2/2011			*	*	*	*
*INFO	69			THE WILL						TALES OF THE STATE OF	
Info 1 - 2		*	*	*	*	*	*	*	*	*	*
Info 3 - 7					Halley			*	*	*	*
Info 8		*	*	*	*	*	*	*	*	*	*
Info 8 - 13				77	PARTITION OF			*	*	*	*
C Programming	77		This was	ALC: N	bing teams			*	*	*	*
Arm Programming	83				10 77	127		*	*	*	*

#### Typing in listings from the yellow pages.

The yellow pages are subdivided into article headings. Each article heading corresponds with its article in the magazine.

So for instance to find listing three of \*INFO in the yellow pages (IntDemo) look for the \*INFO heading, then follow the listings through until you get to listing three. At the beginning of the program are a few lines that tell you what machines it works on. This information can also be derived from the table above.

For Archimedes owners it may not be immediately obvious how to actually type in the listings. By pressing Function key 12 you can access the command line. From here type BASIC and the Archimedes will enter the Basic language. You may like to type MODE 12, which will turn the screen to white on black.

Then simply copy each line of the program in turn after the '>' prompt, pressing RETURN when finished. Save the program onto disc by typing SAVE" < filename > ". It can then be run by typing RUN. You will probably need to debug it as you may have made some typing errors.

When you have finished debugging save the program one last time. Then it can either be double-clicked upon from the desktop, or loaded using LOAD "<filename>".

A more detailed description of how to type in listings from the yellow pages appears in BBC Acorn User August 91.

#### WIRED FOR SOUND

```
160 DIM file% &7A0,voice%(8)
170 DIM c%(4),n%(31)
180 FOR T%=0 TO &79C STEP 4:file%!T%=0
                                                                                                                                                                                                                580 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                    300 IF file%=0 THEN PRINT"Unable to op
                                                                                                                                                                                                                                                                                                                                                                                                         en file":END
310 SYS "OS_File",18,0$,&D3C
320 BPUT #file%,?buffer%
330 A%=buffer%+1
  Listing 1 - Volume
                                                                                                                                                                                                               610 DIM code% 128
620 FOR PASS=0 TO 2 STEP 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10 REM > Volume (Sound1)
20 REM by David Radford
30 REM for Arc only
40 REM (c) BAU July 1992
                                                                                                                                                                                                                                                                                                                                                                                                                 340 B%-1%-1
350 C%-file%
360 D%-phaseacc%
370 CALL alterpitch
380 CLOSE #file%
390 END
400 : 410 DEF PROCassem
410 DEF PROCassem
420 DIM code% 1024
430 FOR PASS-0 TO 2 STEP 2
                                                                                                                                                                                                               640 [OPT PASS
                                                                                                                                                                                                             650 : 660 .measure
670 MOV R2,R0
680 MOV R0,#0
690 CMP R1,#0
700 MOVLE PC,R14
710 .measureloop
720 LDRB R3,[R2],#1
730 TST R3,#128
740 RSBNE R3,R3,#256
            50:
60 INPUT "Enter filename: "f$
70 SYS "OS_File",5,f$ TO a%,,,,1%
80 IF a%v31 THEN 1%=16
90 DIM buffer% 1%
100 SYS "OS_File",255,f$,buffer%,0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        260 source%=0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       270 voices%=4
280 MODE 12:OFF
290 *POINTER 1
             110 :
120 PRINT"Basic or machine code (B/M)
  130 REPEAT G$=GET$:UNTIL G$="B" OR G$="M"
                                                                                                                                                                                                                                                                                                                                                                                                                   450 [OPT PASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            290 *POINTER 1
300 PROCOINTCODE
310 hear%=PALSE:tplayflag=PALSE
320 ON BROOR REPORT:PRINT" at line ";E
RL:CALL restore:RND
330 PRINTTAB[4,1]; "Envelopes"
340 PRINTTAB[4,1]; "Envelopes"
350 PRINTTAB[47,20]; "Length:"
360 PRINTTAB[47,20]; "Octave:"
370 PRINTTAB[65,22]; RIGHT$(CHR$32+STR$
OCLAVE%,2)
380 FOR T%=1 TO 10:PRINTTAB[6,T%+11];
390 IF T%<10 THEN PRINTTAB(6,T%+11);
390 IF T%<10 THEN PRINTTAB(1); T% ELSE
PRINT;T%
                                                                                                                                                                                                                750 CMP R3, R0
                                                                                                                                                                                                                760 MOVGT RØ,R3
                                                                                                                                                                                                                                                                                                                                                                                                                   470 .outputbuffer
480 ]:P%+=256:[OPT PASS
          140 PRINT G$
150 IF G$="M" THEN PROCassem
160 A%=buffer%+1:B%=1%-1
                                                                                                                                                                                                                770 SUBS R1.R1.#1
                                                                                                                                                                                                                                                                                                                                                                                                                 480 ]:P4+=256:[OPT PASS 490: 3
500 .alterpitch 510 STMFD R131, R14) 520 MOV R4, #00 530 ADR R5, outputbuffer 540 MOV R6, R5 550 ADD R8, R6, #256 560 ADD R1, R0, R1 570 .pitchloop 550 CMP R7, R1 600 BGE finish 610 LDRB R7, R0, R4, LSR #24 610 LDRB R7, R0, R4, LSR #26 L10 LDRB R7, R0, R4, LSR #26 L10 LDRB R7, R0, R4, LSR #2
                                                                                                                                                                                                                780 BNE measureloop
790 MOV PC,R14
                                                                                                                                                                                                             790 MOV PC,R14
800 :
810 .scale
820 CMP RI,#0
830 MOVLE PC,R14
840 .scaleloop
850 LDRB R3, [R0]
860 TST R3,#128
870 RSBNE R3,R3,#256
880 MUL R3,R2,R3
890 MOV R3,R3,LSR #7
900 RSBNE R3,R3,#0
            170 :
180 PRINT"Measure volume or scale volu
           190 REPEAT HS=GETS:UNTIL HS="M" OR HS=
           200 PRINT HS'
           200 PRINT H$'
210 :
220 IF H$="M" THEN
230 TIME=0
            230 TIME=0
240 IF G$="M" THEN vol%=USRmeasure ELS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        410 RECTANGLE wavex%-2, wavev%-128-4.51
          vol%=PKmeasure(A%,B%)
250 PRINT"Volume level: ";vol%
260 PRINT"Time taken: ";INT(TIME/100+0
                                                                                                                                                                                                                                                                                                                                                                                                                   610 LDRB R7, [RØ,R4,LSR #24]
620 STRB R7, [R5],#1
                                                                                                                                                                                                               910 STRB R3, [R0], #1
920 SUBS R1, R1, #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420 RECTANGLE pitchx%-2,pitchy%-128-4,
515,263
430 RECTANGLE ampx%-2,ampy%-4,515,136
440 PROCNEWfile
450 PROCHAWFILE
450 PROCHAWFILE
450 PROCHAWFILE
450 PROCHAWFILE
450 PROCHAWFILE
450 REPEAT
480 REPEAT
480 REPEAT
480 REPEAT
490 IF !playflag THEN PROCPLAY
500 MOUSE x%,y%,b%
510 UNTIL b%-0
520 i%-PNICON(x%,y%)
530 CASE i% OF
540 WHEN 0,1,2,3
550 IF SOUTCE%-1% THEN
560 SOUTCE%-1%
570 IF 1%-0 THEN a%-sine ELSE IF i%-1
THEN a%-triangle ELSE IF i%-2 THEN a%-sq
uare ELSE a%-sawtooth
580 ISOUTCEWARVETT-B%
590 CALL calcharmonics
600 PROCdrawbuttons
610 recalc%-FRUE
620 IF hear% oR !playflag THEN CALLCal
CSAMPLE:IF !playflag THEN recalc%-FALSE
630 GCOLO:RECTANGLE FILL wavex%, wavex%
-126,511,255
640 GCOLO:INECTANGLE FILL wavex%, wavex%+51
1, wavey%
650 A%-sc2A0:B%-wavex%:C%-wavev%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420 RECTANGLE pitchx%-2, pitchy%-128-4,
                                                                                                                                                                                                                                                                                                                                                                                                                   63Ø CMP R5, R8
                                                                                                                                                                                                                                                                                                                                                                                                                   640 BLGE writebuffer
650 ADDS R4,R4,R3
                                                                                                                                                                                                                930 BNE scaleloop
940 MOV PC,R14
                                                                                                                                                                                                                                                                                                                                                                                                                 650 ADDS R4,R4,R3
660 ADDS R0,R0,#256
670 B pitchloop
680:
690 .finish
700 CMP R5,R6
710 BLGT writebuffer
720 LDMFD R13!,{PC}
          280 IF G$="M" THEN vol%=USRmeasure ELS
                                                                                                                                                                                                               950 INEXT
960 ENDPROC
           vol%=FNmeasure(A%,B%)
290 PRINT"Volume level: ";vol%
                                                                                                                                                                                                     Listing 2 - Pitch
           300 INPUT"Scale to level (0-127): "lev
el%
310 C%=(level%/vol%)*128
320 IF G$="M" THEN CALL scale ELSE PRO
CScale(A%, B%, C%)
330 FRINT "Output filename (or RETURN
for same):"
340 INPUT ""O$
350 IF G$="" THEN G$=f$
360 SYS "OS_File", 10, O$, £D3C, , buffer%,
buffer%;1
370 ENDIF
380 END
                                                                                                                                                                                                                   10 REM > Pitch (Sound2)
20 REM by David Radford
30 REM for Arc only
40 REM (c) BAU July 1992
50 :
60 INPUT "Enter filename.
                                                                                                                                                                                                                                                                                                                                                                                                                   740 .writebuffer
750 STMFD R13!, (RØ-R4,R14)
                                                                                                                                                                                                              50:

60 INPUT "Enter filename: "f$

70 SYS "OS File",5,f$ TO a%,,,,1%

80 IF a%<-1 THEN 1%=16

90 DIM DUFGER 1%

100 SYS "OS File",255,f$,buffer%,0
                                                                                                                                                                                                                                                                                                                                                                                                                   760 MOV RØ,#2
770 MOV R1,R2
                                                                                                                                                                                                                                                                                                                                                                                                                   780 MOV R2,R6
790 SUB R3,R5,R6
800 SWI "OS_GBPB"
810 MOV R5,R6
           380 END
                                                                                                                                                                                                                                                                                                                                                                                                                   820 LDMFD R13!, (RØ-R4, PC)
830 ]NEXT
840 ENDPROC
                                                                                                                                                                                                               120 INPUT "Enter current pitch (eg.C3)
         390 :
400 DEF PNMeasure(pointer%,length%)
410 LOCAL vol%,a%:vol%=0
420 WHILE length%:0
430 a%=?pointer%:pointer%:=1
440 IF a%>127 THEN a%=256-a%
450 IF a%vol% THEN vol%=a%
460 length%==1
470 ENDMILE
480 avol%
490 :
                                                                                                                                                                                                           170 Info: Enter three pitch: "5$
130 INPUT "Enter new pitch: "5$
140 FRINT "Enter destination filename or RETURN for same):"
150 INPUT "0$
160 PROCassem
170:
180 ol%=VAL(RIGHT$(a$,1))*12
190 o2%=VAL(RIGHT$(b$,1))*12
200 a$=CET$(a$, LENA$-1)
210 b$=LET$(b$, LENA$-1)
220 c$=CED BEF F HG GBA ABB"
230 pl%=ol%+(INSTR(c$,a$)-1)/2
240 p2%=o2%+(INSTR(c$,b$)-1)/2
250 pd%=o2%+(INSTR(c$,b$)-1)/2
                                                                                                                                                                                                                                                                                                                                                                                                         Listing 3 - WaveGen2
                                                                                                                                                                                                                                                                                                                                                                                                                    10 REM > WaveGen2 (Sound3)
20 REM by David Radford
30 REM for Arc only
40 REM (c) BAU July 1992
50:
60 SOUND ON
70 rangeS="Full octave"
80 octave%=0
90 maxlength%=320*1024
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          648 GCOLDINAM WAVE AND ANALYS ANAL
              DEF PROCescale (pointer%, length%, mul
 500 DEF PROCecale(pointer%, length%, mult%)
510 LOCAL %%
520 WHILE length%>0
530 a%=?pointer%
540 IF a%>127 THEN a%=-(((256-a%)*mult%)>>> 7
550 ?pointer%=a%
560 pointer%=a%
560 pointer%+=i:length%=1
570 ENDWHILE
                                                                                                                                                                                                                                                                                                                                                                                                                 90 max!engtn=320*1024
100 wavex%=32:wavey%=800
110 pitchx%=728-60:pitchy%=800
120 ampx%=728-60:ampy%=500
130 barx%=56:bary%=616:barys%=32
140 filetype%=a21A
150 DIM buffer% max!ength%
                                                                                                                                                                                                               250 pd%=p2%-p1%
260 *TUNING 0
                                                                                                                                                                                                    270 SYS "Sound_Pitch",pd%/12*£1000+£25
55 TO phaseacc%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         730 !samplelen=length%*256
740 recalc%=TRUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       750 ELSE
760 IF !playflag THEN
                                                                                                                                                                                                             290 file%=OPENOUT os
```

# PAGES YELLOW

```
1750 IF C%<>0 AND !playflag AND recalc% THEN CALL calcsample:recalc%=FALSE 1760 IF C%<>0 THEN n%(T%)=C%:SOUND C%,& 177, T%*4+5,100 IT70 ENDIF 1780 NEXT 1790 ENDIPOCO
      770 !playflag=FALSE
780 VOICES 1
790 ENDIF
800 %=bary%-barys%*9-8
810 MOUSE RECTANGLE 0,u%,wavex%+513,10
                                                                                                                                                                                                                                                                                                                            2650 MOVE x%, y%: PRINTCHR$5; a$; CHR$4;:OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3680 IF w%=0 THEN GCOL 6:LINE x1%,C%,x2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ,C% 3590 GCOL col%:CALL redraw 3700 mousex%=h%:mousey%=i% 3710 UNTIL j%=0 3720 MOUSE RECTANGLE 0,0,1279,1023 3730 ENDPROC
                                                                                                                                                                                                                                                                                                                             2660 ENDIF
2670 i%+=1:UNTIL a$="end"
                                                                                                                                                                                                                                                                                                                              2680 a$=STRING$(3,CHR$32)
2690 b$="Z X C V B N M Q W E R T Y U I
        820 !samplelen=256
                                                                                                                                                                  1790 ENDPROC
                                                                                                                                                                                                                                                                                                                             2700 c$=CHR$32+"S D"+a$+"G H J"+a$+"2 3
        830 !alternative=harmenv%
                                                                                                                                                                                                                                                                                                                         "+a$+"5 6 7"+a$+"9 0"
2710 IF NOT iplayflag THEN b$=STRING$(4
0,CHR$32):c$=b$
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3750 DEF PROCalterlength(d%,n%,p%)
                                                                                                                                                                 1810 DEF PROCdrawbar(x%, y%, v%, c%)
         840 recalc%=TRUE:CALL calcsample
850 SOUND 1,&17F,&4000,100
                                                                                                                                                                 1820 IF c% THEN
1830 GCOL 7:RECTANGLE x%, y%, 256+2, 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3760 TIME=0:length%+=d%
         860 ENDIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3770 REPEAT
3780 MOUSE a%,b%,c%
3790 IF TIME>380 AND (TIME MODIS)<2 THEN
length%=d%:IF TIME>150 d%=5GM(d%)
3800 IF length%:0 THEN length%:10
3810 IF length%:256 THEN length%:156
3820 a$=STR$length%:256
3820 a$=STR$length%:256
3820 a$=STR$length%:a$=STRING$(4-LENA$,
CHR$32)+a$
3830 WAIT:PRINTAB(48,22);a$;
3840 UNTIL a%cn% OR a%>=n%+56 OR b%cp%
OR b%=p%+56 OR c%=0
3850 !samplelenelength%*256
3860 recalc%=TRUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3770 REPEAT
        870 hear%=NOT hear%
880 PROCdrawbuttons
                                                                                                                                                                 1840 ENDIF
                                                                                                                                                                                                                                                                                                                              2720 PRINTTAB(23.30):b$:TAB(23.29):c$
                                                                                                                                                             1840 ENDIF
1850 IF v%>0 THEN GCOL 1:RECTANGLE FILL
x%+2,y%+4,v%*2-1,8
1860 IF v%-(128 THEN GCOL 0:RECTANGLE FI
LL x%+v%+2/2,y%+4, (128-v%)*2-1,8
1870 ENDPROC
1880 :
1890 DEF PROCdragbar(bx%,by%,ys%,b%,x%,v%)
                                                                                                                                                                                                                                                                                                                             273Ø ENDPROC
       880 PROCdrawbuttons
890 WHEN 5
900 !playflag=NOT!playflag
910 PROCdrawbuttons
920 IF NOT!playflag THEN
930 VOICES 1:SOUND 1.0.100,10
940 IF foreign% THEN
950 MOUSE RECTANGLE 0.0.1279,1023
960 recalc%=TRUE:!samplelen=length%*25
                                                                                                                                                                                                                                                                                                                              2740
                                                                                                                                                                                                                                                                                                                        2740:
2750 DEF FNICON(x%,y%)
2750 RESTORE +0:1%=-1:j%=0
2770 REPEAT
2780 READ xmin%,ymin%,xmax%,ymax%,a%
2790 IF x%>=xmin% AND x%
xmax%+xmin% AND y%>=ymin% THEN i%=j
                                                                                                                                                             y%)
1900 MOUSE RECTANGLE bx%, by%-ys%*h%, 256
                                                                                                                                                                                                                                                                                                                             2800 j%+=1
2810 UNTIL a$="end" OR i%<>-1
        970 foreign%=FALSE
        980 SYS "Sound_Configure",0,,48
                                                                                                                                                                  1920 REPEAT
                                                                                                                                                                                                                                                                                                                           2820 = 1%
2830 to ATA 352,580,180,56,"Sine"
2840 DATA 352,520,180,56,"Sine"
2850 DATA 352,460,180,56,"Square"
2860 DATA 352,460,180,56,"Square"
2870 DATA 352,460,180,56,"Square"
2880 DATA 352,328,180,56,"Square"
2880 DATA 352,328,180,56,"Square"
2890 DATA 352,328,180,56,"Square
2890 DATA 480,165,240,56,"Stoad data"
2910 DATA 480,165,240,56,"Cload data"
2920 DATA 720,156,80,56,"**
2930 DATA 800,155,240,56,"*Save sample"
2940 DATA 480,155,240,56,"*Save ample"
2940 DATA 480,155,240,56,"*Save ample"
2930 DATA 800,155,240,56,"*Reset pitch"
2930 DATA 800,420,220,56,"*Reset amp."
2930 DATA 700,276,56,56,"*"
2930 DATA 00,101,240,55,"*A Notes"
3000 DATA 240,104,240,55,"A Notes"
3000 DATA 240,164,240,56,"A Notes"
3010 DATA 240,156,49,56,"Cload sample"
3010 DATA 1808,276,56,56,"*"
3050 DATA 1808,276,56,56,"*"
3050 DATA 1808,276,55,56,"*"
3050 DATA 1040,00,00,0"end"
3060 DEF PROCemallWindow
3060 VDD DEF PROCemallWindow
                                                                                                                                                                                                                                                                                                                              282Ø =i%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3860 recalc%=TRUE
3870 ENDPROC
                                                                                                                                                                 1930 MOUSE newx%, newy%, b%
1940 IF newx%>bx%+256 THEN newx%=bx%+25
      1000 ELSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3890 DEF PROCerror
  1010 IF recalc% THEN CALLcalcsample:rec
alc%=FALSE
                                                                                                                                                                1550 IF (newx% AND (NOT1))<>x% THEN
1560 X*=newx% AND NOT 1
1570 Y*=(x*-bx*)/2
1580 FROCATABAT(bx*, by*-ys**h*, v*, 0)
1590 file% (h*+220) =v*
2000 CALL calcharmonics
2010 recalc%=TRUE
2020 IF hear's THEN CALL calcsample
2030 GOLD:RECTANGLE FILL wavex%, wavey%
1728.511.255.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3900 IF ERR=17 THEN
3910 SYS "OS_Byte",138,0,13
3920 ELSE
     .lc%=FALSE
1020 VOICES voices%
1030 FOR T%=1 TO voices%:SOUND T%,0,100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3920 ELSE
3930 PRINT'REPORT$;" (Error &"; "ERR;")"
3940 ENDIP
3950 ENDPROC
3960 :
3970 DEF PROCloadsample
3980 LOCAL ERROR
3980 BOCAL ERROR
   105.0 FOR 1-10.1 NEXT
104.0 %()=0.105.0 ENDIF
105.0 ENDIF
105.0 ENDIF
105.0 WHEN 6:PROCSavedata
107.0 WHEN 7:PROCCloaddata
109.0 WHEN 9:PROCCammand
109.0 WHEN 9:PROCSavesample
110.0 WHEN 10:quitb=TRUE
111.0 WHEN 11:PROCTeset(£IA0,0,0)
112.0 WHEN 12:PROCTeset(£IA0,60808080,1)
113.0 WHEN 13:PROCalterlength(-1,700,276
                                                                                                                                                                128,511,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3990 PROCsmallwindov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4000 ON ERROR LOCAL PROCERTOR
                                                                                                                                                                2040 GCOL6:LINE wavex%, wavev%, wavex%+51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4010 REPEAT
4020 INPUT"Enter filename: "a$
4030 l%=0:a%=1
4040 IF a$<."" THEN SYS "OS_File",5,a$
70 a%,...!%
4050 IF a%<)1 THEN PRINT'"File '";a$;"'
not found"
4050 IF a%=1 AND l%=maxlength% THEN PR
INT"Sample is too large - alter maxlength
% variable at start of program"
4070 UNTIL a$="" OR (a%=1 AND l%=maxlength%)
(b%) UNTIL a$="" OR (a%=1 AND l%=maxlength%)
(b%) UNTIL a$="" OR (a%=1 AND l%=maxlength%)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4010 REPEAT
                                                                                                                                                                 2050 A%=&2A0:B%=wavex%:C%=wavev
                                                                                                                                                                 2060 E%=4:F%=128:GCOL 7:CALL redraw
                                                                                                                                                                2050 Brud=17%=128:COLD 7:CALL redraw

2070 ENDT

2080 UNTIL b%=0

2090 U%=baryk-barys%*9-8

2100 IF hear% THEN U%=baryk-barys%*9-8:

%=wavex%+513 ELSE U%=0:V%=1279

2110 MOUSE RECTANGLE 0,U%,V%,1023-U%

2120 ENDPROC

2130 :
]
1140 WHEN 14:PROCalterlength(1,844,276)
1150 WHEN 15,16
1160 voices%=[i$-14]*2
1170 IF !playflag THEN VOICES voices%
1180 PROCdrawbuttons
1190 WHEN 17:PROCloadsample
1200 WHEN 18
1210 IF range$="Full octave" THEN range
$="Half octave" ELSE range$="Full octave"
                                                                                                                                                                                                                                                                                                                              3000 :
3070 DEF PROCsmallwindow
3080 VDU 28,0,31,79,25,12
3090 ON:MOUSE OFF:*FX 15
                                                                                                                                                                  2140 DEF PROCnewfile
                                                                                                                                                               2150 FOR T%=0 TO 9:PROCdrawbar(bar%,ba
ry%-barys%*T%,file%?(T%+620),TRUE):NEXT
2160 !samplelen=length%*256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4080 IF !slot=0 THEN CALL setupsound
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4080 IF !slot=0 THEN CALL setupsound
4090 IF !slot=0 THEN NOICESVOICes%
4100 IF a$<>"THEN
4110 SY "OS.File",255,a$,buffer*,0
4120 a%=(1%+255) AND (NOT255)
4130 !samplelen=a%:!playflag=TRUE:recal
%=FALSE
                                                                                                                                                                                                                                                                                                                               3100 ENDPROC
      1220 PROCdrawbuttons
                                                                                                                                                                                                                                                                                                                             3110 :
3120 DEF PROCfullwindow
3130 VDU 12,26
3140 MOUSE ON:OFF
3150 PROCdrawbuttons
3160 IF !Slot=0 THEN CALL setupsound
3170 IF !playflag THEN VOICESvoices%
3180 ENDPROC
3190 :
    1220 PROCQTawbuttons
1230 PROCQTawbuttons
1240 Procalc%=TRUE
1250 WHEN 19:PROCalteroctave(-1)
1260 WHEN 30:PROCalteroctave(1)
1270 OTHERMISE
1280 %%=-1FOR T%=0 TO 9
1290 IF y%=bary%-barys%*T% AND y%<bary*barys%=T%=20 THEN h%=T%
1300 NEXT
1310 IF h%=0 AND x%>=barx% AND x%<bary*b258 THEN
                                                                                                                                                              2160 !Samplelength**256
2170 IF SOURCe%=0 THEN A%=sine ELSE IF
source%=1 THEN A%=triangle ELSE IF source
e%=2 THEN A%=square ELSE A%=sawtooth
2180 !Sourcewaveptra%
2190 CALL calcharmonics
2200 CALL calcharmonics
2200 CALL calcharmonics
2210 CCOLO:RECTANGLE FILL wavex%, wavey%
-128,511,255
2220 CCOL6:LINE wavex%, wavey%, wavex%+51
                                                                                                                                                                                                                                                                                                                               3110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C%=FALSE
4140 IF a%>1% THEN FOR T%=1% TO a%-1:bu
ffer%7T%=0:MEXT
4150 foreign%=TRUE:VOICES voices%:n%()=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      oreign=#rworvoics voices:ns():
0:c%()=0
4160 MOUSE RECTANGLE 0,104,479,111
4170 SYS "Sound_Configure",0,,?buffer%
4180 ENDIF
4190 PROCfullwindow
                                                                                                                                                                                                                                                                                                                              3190 :
3200 DEF PROCcommand
3210 LOCAL ERROR
                                                                                                                                                               1,wavey%
2230 A%=62A0;B%=wavex%;C%=wavey%
2240 E%=4:F%=128:GCOL 7:CALL redraw
2250 recalc%=FALSE
2260 GCOL0:RECTANGLE FILL pitchx%,pitch
                                                                                                                                                                                                                                                                                                                             3220 PROCSmallwindow
3230 ON ERROR LOCAL PRINT'REPORT$;" (Er
   %+258 THEN
1320 PROCdragbar(barx%,bary%,barys%,h%,
                                                                                                                                                                                                                                                                                                                           ror &";"ERR;")"
3240 *FX 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4200 ENDPROC
                                                                                                                                                                                                                                                                                                                             3240 *PX 15
3250 REPEAT
3260 INPUT***a$
3270 OSCLI(a$)
3280 UNTL a$=""
3290 PROCfullwindow
3390 ENEPOCC
3310 :
3320 DEF PROCedit(w%)
3330 IF w=0 THEN
3340 AL=61A0:B%=pitchx%:C%=pitchy%
3350 PM=17*e=128:col%=7
3350 MOUSE RECTANGLE pitchx%,pitchy%-12
3511.255
 1340 IF x%>=ampx%-2 AND x%<ampx%+514 AND y%>=ampy%-4 AND y%<ampy%+136 THEN PROC edit(1)
                                                                                                                                                               y%-128,511,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4220 DEF PROCSavesample
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4220 DEF PROCasvesample
4230 LOCAL ERROR
4240 PROCamallwindow
4250 XN=0
4260 ON BEROR LOCAL PROCERTOR: F XN<0
THEN AN=XN:XN=0:CLOSE#AN
4270 OXN=PAINSE
4290 INPUT "Enter filename: "f$
4300 IF f5<>"" THEN
4310 IF f5<>"" THEN
4310 IF XN=0*PENOUTE$
4320 IF NN=0 THEN
4330 PRINT" "Unable to open file"
4340 ELSE
                                                                                                                                                                 2270 GCOL6:LINE pitchx%,pitchy%,pitchx%
D y%-ampy*-4 AND y%-ampy*+136 THEN PROC
edit(1)
1350 Ff x%-epitchx%-2 AND x%cpitchx%+51
4 AND y%-epitchy%-132 AND y%cpitchy%+132
THEN PROCedit(0)
1360 ENDIF
1370 ENDCASE
1380 REPEAT
1390 IF |playflag THEN PROCplay
1400 MOUSE x%, y%, b%
1410 UNFIL b%=0
1420 UNFIL Quit%
1430 MODE 12:FX 15
1440 CALL restore
1450 FOR 7%-2 TO 8
                                                                                                                                                               1200 CCOLO: Ball petchx%: C%=pitchy%
2280 A%=&1A0:B%=pitchx%: C%=pitchy%
2290 E%=1:F%=128:GCOL 7:CALL redraw
2300 GCOL0: RECTANGLE FILL ampx%, ampy%, 5
                                                                                                                                                               2300 GCOLO:RECTANGLE FILL ampx*, ampy*, 5
11, 128
2310 A%=&A0:B%=ampx*:C%=ampy*
2320 E%=1:F%=256:GCOL 2:CALL redraw
2330 hear*=FALSE:!playflag=FALSE:VOICES
                                                                                                                                                                   2340 PRINTTAB(48,22);RIGHT$(STRING$(4,C
                                                                                                                                                               HR$32)+STR$length%,4)
2350 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4340 ELSE
                                                                                                                                                                                                                                                                                                                             3380 A%=&A0:B%=ampx%:C%=ampy%
3390 B%=1:F%=256:c01%=2
3400 MOUSE RECTANGLE ampx%,ampy%,511,12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4350 IF recalc% THEN CALLcalcsample:rec
     1440 CABL Festore
1450 FOR T%=2 TO 8
1460 SYS "Sound_AttachVoice",T%,voice%(
                                                                                                                                                                 2370 DEF PROCreset(A%, v%, w%)
2380 FOR T%=A% TO A%+252 STEP 4:file%!T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        alc%=FALSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .lc%=FALSE
4360 BPUT #X%,48
4370 SYS "OS_GBPB",2,X%,buffer%,length%
                                                                                                                                                               %=v%:NEXT
                                                                                                                                                                                                                                                                                                                             3
3410 ENDIF
3420 mousex%=-1:mousey%=-1
3430 REPEAT
3440 REPEAT
3450 HOUSE h%,1%,1%
3460 Nh=h% AND &FFFE:1%=1% AND &FFFC
3470 IF 1]ayflag THEN PROCDIAY
3480 UNTIL h%<>mousex% OR 1%<>mousey% O
      1470 NEXT
                                                                                                                                                                 239Ø GCOL Ø
                                                                                                                                                               2390 GCOL 0
2400 IF w4=0 THEN
2410 RECTANGLE FILL pitchx*, pitchy*-128
,511,255
2420 GCOL6:LINE pitchx*, pitchy*, pitchx*
+511,pitchy*
2430 B*=1:F*=128:GCOL 7:CALL redraw
2450 Ftsp:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           256
4380 CLOSE#X%:X%=0
4390 SYS "OS_File",18,f$,£D3C
4400 ok%=TRUE
4400 ENDIF
4420 ENDIF
4420 ENDIF
44430 UNTIL ok% OR f$=""
4440 PROCfullWindow
      148Ø END
   1490 :
1590 DEF PROCpitchrange
1510 LOCAL T%, R%
1520 IF range$="Full octave" THEN R%=&1
000 ELSE R%=&800
     1530 FOR T%=0 TO 255
1540 a%=&4555+((T%EOR128)-128)*R%/128+o
                                                                                                                                                                  2450 ELSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            445Ø ENDPROC
                                                                                                                                                                                                                                                                                                                              3490 recalc%=TRUE
3500 IF mousex%=-1 THEN mousex%=h%:mous
                                                                                                                                                                   2460 RECTANGLE FILL ampx%, ampy%, 511, 128
   ctave%*&1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4460 :
4470 DEF PROCsavedata
      1550 SYS "Sound Pitch", a% TO pitchtable
                                                                                                                                                                   2470 B%=ampx%:C%=ampy%
2480 E%=1:F%=256:GCOL 2:CALL redraw
                                                                                                                                                                                                                                                                                                                         3500 IF MOUNEXW-1 THAN MOUNEXA-RS.

5510 IF h%=mounex% THEN
3520 file%; (A%+(h%-B%); /2) = (i%-C%)
3530 x1%=h%-2:x2%=h%-2
3540 ELSE
3550 kEmounex%:m%=h%
3550 c%=mounex%:m%=h%
3570 IF k%>m% THEN SWAP k%,m%:SWAP c%,p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4470 DEF PROCawadata
4480 LOCAL ERROR
4490 PROCamallwindow
4500 FOR a%weild TO &29C STEP 4:file%!a
%=file%!a% EOR £80808080:NEXT
4510 ON ERROR LOCAL PROCerror
4520 INPUT "Enter filename: "f$
4530 IF f$
4530 IF f$
4540 a$=f$
4550 WHILE INSTR(a$,":")>0:a$=MID$(a$,I
NSTR(a$,":")+1):ENDWHILE
4560 WHILE INSTR(a$,":")>0:a$=MID$(a$,I
NSTR(a$,":")+1):ENDWHILE
4570 a%=16+2*source%
4580 $file%=LEFT$(a$,31)
4590 file%1642=56
4600 file%1642=56
4600 file%1642=56
4600 file%1650=22FP
4610 file%1650=22FP
4620 file%1650=256
4630 file%1650=256
46400 file%1650=169th<464
4650 FOR a%=file%+620 TO file%+629:a%?1
0=?a%:a%?20=?a%:a%?30=?a%:NEXT
       1560 NEXT
1570 ENDPROC
                                                                                                                                                                   2490 ENDIF
                                                                                                                                                                   2500 recalc%=TRUE
       1580
                                                                                                                                                                   2510 ENDPROC
1590 DEP PROCalteroctave(i%)
1690 DEP PROCalteroctave(i%)
1600 octave%+2 THEN octave%=2
1620 IF octave%-2 THEN octave%=-2
1630 PRINTAB(65,22);RIGHT$(CHR$32+STR$
octave%,2)
1640 PROCpitchrange:recalc%=TRUE
1650 ENDPROC
1660:
1670 DEP PROCplay
1680 LOCAL T%, A%, B%, C%
1690 FOR T%=0 TO 31:A%=keylist?T%
1700 IF A%=1 THEN keylist?T%=0
1710 IF n%(T%)<0 AND A%=1 THEN SOUND n%(T%)=0
1720 IF n%(T%)=0 AND A%=2 THEN
1730 CT%=0:FOR B%=1 TO voice%:IF c%(B%)
1730 CT%=0:FOR B%=1 TO voice%:IF c%(B%)
       1590 DEF PROCalteroctave(i%)
                                                                                                                                                                   2530 DEF PROCdrawbuttons
                                                                                                                                                              2530 DEF PROCdrawbuttons
2540 RESTORE +0
2550 i%=0:REPEAT
2550 i%=0:REPEAT
2550 READ xmin%, ymin%, xmax%, ymax%, a$
2570 IF a$<->*end** THEN
2580 IF i%=source% OR (i%=4 AND hear%)
OR (iplayfiag AND i%=5) OR (i%=15 AND vo
ces%=2) OR (i%=16 AND voices%=4) THEN G
COL 0,1 ELSE GCOL 0,4
2590 RECTANGLE FILL xmin%+2, ymin%+4, xma
x%-4, ymax%-12
2600 GCOL 0,7
2610 RECTANGLE xmin%, ymin%, xmax%-2, ymax
                                                                                                                                                                                                                                                                                                                          %

3580 x1%=k%-2:x2%=m%+2

3590 k%=(k%-B%)/2:m%=(m%-B%)/2

3600 c%=(c%-c%):p%=(p%-c%)

3610 FOR q%=k% TO m*:file%?(A%+q%)=o%+I

NY(0.5+(q%-k%)*(p%-o%)/(m%-k%))

3620 NEXT

3630 ENDIF

3640 IF x1%-D% THEN x1%-B%
                                                                                                                                                                                                                                                                                                                           3630 ENDIF
3640 IF x1%-G% THEN x1%-B%
3650 IF x2%-B%+511 THEN x2%-B%+511
3650 GCDL
3670 IF w%=0 THEN RECTANGLE FILL x1%,C%
-128,x2%-x1%,255 ELSE RECTANGLE FILL x1%,C%,C%,x2%-x1%,128
                                                                                                                                                                  2600 GCOL 0,7
2610 RECTANGLE xmin%, ymin%, xmax%-2, ymax
```

2620 IF RIGHT\$(a\$,1)="\$" THEN a\$=EVAL(a

2630 x%=xmin%+xmax%/2-LEN(a\$)\*8 2640 y%=ymin%+ymax%/2+14

1730 C%=0:FOR B%=1 TO voice8%:IF C%(B%) =0 AND C%=0 THEN C%=B%:C%(B%)=255 1740 NEXT

```
8130 MOV RO,#255
8140 ADR R1, harmonictemp
8150 MOV R2,#0
8160 ADR R3, R1, Barmonictemp
8150 MOV R2,#0
8170 LDR R3, [R1],#4
8180 CMP R3,#0
8200 CMP R3,R2
8210 MOVGT R2,R3
8220 SUBS R0,R0,#1
8230 BMK getvolume
8240 SUBS R2,R2,#128
8250 MOVLT R2,#8108008
8240 SUBS R2,R2,#128
8250 MOVLT R2,#8108008
8260 BLT dontLookup
8270 LDR R0, scaleptr
8280 ADD R8,R0,#1
8310 CRR R2,R1,R2,LSL #1
8320 LDRB R1,[R0]
8330 ADR R0,harmonictemp
8340 LDR R1,fileptr
8350 ADR R4,#256
                                                                                                                                                                                                                                                                                                                                                                                                                                               5770 ADRCS R7.P%+8
5780 BCS nextwave
5790 LDRB R7.[R4, R1, LSR #24]
5800 LDRB R7.[R6, R7, LSL #5]
5810 SUBS R7.R7, R0, LSL #1
5820 MOYNI R7, 400
5830 STRB R7, [R12], R11
5840 ]:NEXT:[OPT PASS
5850 CMP R12, R10
5860 BLT fillloop
5870 STML R9, (R1-R5)
5880 MOY R0,#8
5890 LDMPD R131, {PC}
5990 :
       4660 SYS "OS_File", 10,f$,filetype$,,file$,file$+67A0
4670 ENDIF
4680 FOR a*=$1A0 TO $29C STEP 4:file$!a
*=file$!a$ EOR $80808080:NEXT
4690 FOCTullVindow
4700 ENDPROC
4710:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6960 STMIA R1, (RØ, R2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6970 ADR RØ, voice
6980 MOV R1, #0
6990 SWI "XSound_InstallVoice"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              970 ADR R0, voice
6980 MOV R1, #6
6990 SWI "XSound_InstallVoice"
7000 BVS sounderror
7010 TeQ R1, #6
7020 BEQ sounderror
7030 STR R1, #1
7050 BEQ sounderror
7040 MOV R0, #1
7050 SWI "XSound_AttachVoice"
7060 STR R1, oldslot
7070 ADR R4, enrypars
7080 MOV R6, #0
7090 MOV R6, #0
7100 MOV R7, #0
7110 MOV R0, #6
7110 MOV R0, #6
7110 MOV R0, #6
7110 ADR R3, harmonictemp
7140 ADR R3, harmonictemp
7140 ADR R3, harmonictemp
7140 ADR R3, harmonictemp
7140 STWUCTA R41, (R5-R7)
7190 MOV R3, #1
7190 ADR R1, extrhandler
7200 MOV R2, #0
7210 MOV R3, #1
7210 MOV R3, #1
7220 SWI "XOS_ChangeEnvironment"
7230 STMVSIA R41, (R5-R7)
7240 STMVCIA R41, (R1-R3)
7250 MOV R0, #16
7260 ADR R1, upcall
7270 MOV R2, #0
7280 MOV R3, #0
7290 SWI "XOS_ChangeEnvironment"
7300 STMVSIA R41, (R5-R7)
7300 STMVSIA R41, (R5-R7)
7300 STMVSIA R41, (R1-R3)
7310 STMVCIA R41, (R1-R3)
7320 MOV R0, #16
7330 ADR R1, upcall
7330 ADR R1, upcal
7340 MOV R0, #14
7370 MOV R0, #14
                   4730 LOCAL ERROR
4740 PROCsmallwindow
4750 OW ERROR LOCAL PROCEITOR
4760 REPEAT
4761 NPUTTENET filename: "a$
4780 l%=67A0:a%=1
4790 IF a$<-"" THEN SYS "OS File",5,a$
TO a%,,,1%
4800 IF a$<-"" THEN SYS "OS File",5,a$;"'
not found"
4810 IF a%=1 AND l%<>67A0 THEN PRINT"Th
is is not a HarmSynth file"
4820 UNTIL a$="" OR (a%=1 AND l%=67A0)
4830 IF a$<-"" THEN
4840 SYS "OS File",255,a$,file%,0
4850 FOR a%=61A0 TO £29C STEP 4:file%!a
%=file%!a% EOR &60808080:NEXT
4860 SOURCE%=0
                   4750 ON ERROR LOCAL PROCERTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                             5880 MOV RO,#85
5890 LIMPE RI31, (PC)
5900:
5910 .nextwave
5912 ADD R4, R4, #256
5913 SUBS R5, R5,#256
5948 MOVGT PC,R7
5950 LDR R5, #10
5970 BEQ nolooping
5960 TEQ R5,#0
5970 BEQ nolooping
5980 LDR R5, samplelen
6008 MOV PC,R7
6010 .nolooping
6008 MOV R7,#0
60310 .lankloop
6040 STRB R7, R12],R11
6060 BLT blankloop
6050 CMF R12,R10
6060 BLT blankloop
6070 STMB R9, (R1-R5)
6080 MOV R0,#2
6090 LDMFD R13, (PC)
6100 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3350 ADD R1,R1,#22A0
3350 MOV R4,#256
3370 .scaleharmonics
3380 LDR R3, R80],#4
3390 CMP R3,#0
440 RSLT R3,R3,#6
4410 MUL R3,R2,R3
4410 MUL R3,R2,R3
4410 MUL R3,R2,R3
4410 MUL R3,R2,R3
4410 MUL R3,R3,ESL #16
4410 RSBLT R3,R3,#6
4410 RSBLT R3,R3,#6
4410 MUL R3,R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,R3,ESL #8
4410 MUL R3,R3,ESL #8
4410 MUL R3,R3,R3,ESL #
              4860 source%=0
4870 a%=file%744F:IF (a% AND16) THEN
4880 FOR b%=3 TO 0 STEP -1:IF a% AND (2
b%) THEN source%=b%
              b%) THEN SO
4890 NEXT
4900 ENDIF
              4900 ENDIF

4910 length%=(file%165C) >>>8

4920 IF length%=0 THEN length%=200

4930 PROChewfile

4940 ENDIF

4950 PROCfullWindow
                                                                                                                                                                                                                                                                                                                                                                                                                                                  6100 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                  6110 .gateoff
6120 MOV RØ,#0
                                                                                                                                                                                                                                                                                                                                                                                                                                             0110 MOV R0, #0
6130 Jgateoffloop
6130 Jgateoffloop
6140 STRB R0, [R12], R11
6150 STRB R0, [R12], R11
6150 STRB R0, [R12], R11
6170 STRB R0, [R12], R11
6180 CMP R12, R10
6190 BLT gateoffloop
6200 MOV R0, #1
6210 LDMFD R13, {FC}
6220 :
6230 .errorhandler
6240 STMFD R131, [R0-R4, R14)
6250 BL restore
6260 LDMFD R131, [R0-R4, R14)
6270 SWI "OS_GenerateError"
6280 SWI "OS_GenerateError"
6280 SWI "OS_GenerateError"
6280 SWI "OS_GenerateError"
                 4960 ENDPROC
            4970 :
4980 DEF PROCinitcode
4990 DIM code% 7164
5000 FOR T%=code% TO code%+7160 STEP 4
            5010 !T%=0:NEXT
5020 FOR PASS=0 TO 2 STEP 2
              5030 P%=code%
    5030 P%=code%
5040 [OPT PASS
5050 :
5060 .playflag EQUD 0
5070 .keylist FNr(32)
5090 .keytable FNr(128)
5090 .event
5100 .event
5110 CMP RO,#11
5120 MOVNES PC,R14
5130 LDR RO,playflag
5140 TEQ RO,#0
5150 BEQ eventout
5160 ADR RO,keytable
5170 LDRB RO,[RO,R2]
5180 TEQ RO,#255
5190 EQ eventout
5200 STMFD R131, (R1,R2)
5210 ADR R2,keylist
5230 STME R1,R2,R0]
5240 LDMFD R31, (R1,R2)
5250 .eventout
5260 MOV R0,R1,#1
              5040 [OPT PASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7450 .error
7460 EQUD 0
7470 EQUS "Unable to install voice gene
                                                                                                                                                                                                                                                                                                                                                                                                                                             6280 SNI "OS EXIL"
6290 :extitandler
6390 sTMPD R11; (R0-R4,R14)
6310 BL restore
6220 LDMPD R13; (R0-R4,R14)
6330 SNI "OS EXIL"
6340 :upcall
6350 TEQ R0,#256
6360 MOVNES PC,R14
6370 STMPD R13; (R0-R4,R12,R14)
6380 BL restore
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7480 EQUS "Unable to inst
rator"
7480 EQUB Ø:ALIGN
7490 :
7500 .sampleptr EQUD Ø
7510 .samplelen EQUD 256
7520 .logptr EQUD Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7490 .sampleptr ...
7510 .samplelen EQUD 256
7520 .logptr EQUD 0
7530 :
7540 .redraw
7550 \ r0 = file offset
7560 \ r1 = xco
7570 \ r2 = yco
7580 \ r4 = step
7590 \ r5 = 128 for signed or 256 for u
nsigned
7600 MoV R16, R5
7610 LDR R7, fileptr
7620 ADD R5, R7, R0
7630 MOV R6, R2
7640 MOV R0, #4
7655 MOV R8, #256
7660 .redrawloop
7670 LDRB R7, [R5], R4
7680 TST R7, R10
7690 RSBNE R7, R7, #256
7700 ADDEC R2, R6, R7
7710 SUBNE R2, R6, R7
7710 SUBNE R2, R6, R7
7710 SUBNE R2, R6, R7
7710 BUS R8, R8, #1
7760 MOV R0, #0
7810 ADD R1, R1, #2
7740 MOV PC, R14
7780 :
7790 .calcharmonics
7800 MOV R0, #0
7810 ADR R1, harmonictemp
7820 MOV R2, #1024
7830 .wipebuffer
7840 STR R0, [R1], #4
7850 SUBS R1, R2, #4
7860 BUS wipebuffer
7870 LDR R0, sourcewavetr
7880 LDR R1, fileptr
7890 MOV R2, #10
7910 MOV R2, #10
7910 MOV R2, #10
7910 MOV R2, #10
7910 MOV R3, #256
7960 MOV R3, #256
7960 MOV R3, #256
7960 ADR R7, harmonictemp
7970 MOV R3, #256
7960 MOV R4, #3
7970 MOV R4, #3
7970 MOV R5, #1.c24
7990 MOV R3, #256
7960 MOV R6, #2556
8010 MUL R6, R3, R6
8020 MOV R6, R6, LSR #7
8030 RSBNE R6, R6, #356
8010 MUL R6, R3, R6
8020 MOV R6, R6, LSR #7
8030 RSBNE R6, R6, #356
8010 MUL R6, R3, R6
8020 MOV R6, R6, LSR #7
8030 RSBNE R6, R6, #366
8050 STR R9, [R7]
8050 ADD R9, R8, R6
8050 STR R9, [R7]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8720 LDRB R12, [R4, R16,LSS
8730 ADD R10, R10, R9
8740 TST R12,#128
8750 RSBHE R12, R12,#256
8760 MUL R12,R7,R12
8770 MOV R12,R12,LSR #7
8780 RSBHE R12, R12,#255
8790 STRB R12, R12,#255
8790 STRB R12, R10, #1
8800 SUBS R1,R1,R5
8830 BOT calcsampleloop1
8840 MOV PC,R14
                                                                                                                                                                                                                                                                                                                                                                                                                                                  6380 BL restore
6390 ADR RØ, envpars+24
6400 LDMIA RØ, (R1, R12)
                                                                                                                                                                                                                                                                                                                                                                                                                                          0390 ADR R.G. (R1, R12)
6410 LDR R0, (R1, R12)
6410 LDR R0, (R13)
6420 LDR R2, (R13, 80]
6430 ADR R14, P%+8
6440 MOV PC, R1
6450 STR R0, (R13)
6460 LDMTD R13, (R0-R4, R12, R14)
6470 MOVS PC, R14
6480 :
6590 STMTD R13, (R14)
6510 ADR R4, envpars
6520 MOV R0, #6
6530 LDMTA R41, (R1-R3)
6570 SNI "XOS ChangeEnvironment"
6550 MOV R0, #11
6550 LDMTA R41, (R1-R3)
6570 SNI "XOS ChangeEnvironment"
6580 MOV R0, #16
6590 LDMTA R41, (R1-R3)
            5250 .eventout
5260 MOV RØ,#11
              5270 MOVS PC, R14
         5280 :
5290 .voice
5300 .vample must be a multiple of 256
5310 \ bytes long - add zeros to the en
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8840 MOV FURNA

8850:

8860: alternative EQUD 0

8870: scaleptr EQUD 0

8880: sourcewaveptr EQUD 0

8890: fileptr EQUD 0

8900: picchtableptr EQUD 0

8910: harmonictemp FNr(1024)
       1
5320 \ to make up the length!
5330 B fill
5340 B update
5350 B gateon
5360 B gateoff
5370 B instantiate
5380 LDMFD R131, (PC)
5400 EQUD volcename-voice
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8910 : harmonictemp FNr(1024)
8920 : 8930 .pitchtable FNr(1024)
8940 .scalelookup FNr(10*128*2+2-128*2)
8950 .sine FNr(255)
8960 .triangle FNr(255)
8970 .sawtooth FNr(255)
8980 .square FNr(255)
                                                                                                                                                                                                                                                                                                                                                                                                                                             5380 MOV RO,#16
5590 LDMTA R41, (R1-R3)
6590 LDMTA R41, (R1-R3)
6600 SNI "XOS_ChangeEnvironment"
6510 ADR R0,config
6520 LDMTA R0, (R0, R2)
6630 MOV R1,#0
6640 MOV R3,#0
6650 MOV R4,#0
6660 SNI "XSound_Configure"
6670 LDR R1, slot
6680 SWI "XSound_RemoveVoice"
6690 MOV R0,#0
6700 STR R0, slot
         5410 .voicename
5420 EQUS "TestVoice2"
5430 EQUB 0:ALIGN
    5430 EQUB 0:ALIGN
5440:
1. Instantiate
5460 STMFD R13:,(R0-R4)
5470 MOV R0,#0
5490 MOV R1,#0
5490 MOV R2,#0
5500 MOV R3,#0
5510 MOV R4,#0
5520 SMI "XSound_Configure"
5530 LDRVC R0,[R3,#8]
5540 STRVC R0,logptr
5550 STRVS R0,[R13]
5550 STRVS R0,[R13]
5550 LDMFD R13!,(R0-R4,PC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8990 :-
9900 | NEXT
9000 | NEXT
9010 FOR T%=128 TO 10*128
9020 scalelookup! ((T%-128)*2)=127/T%*£1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9020 Scale100xUp: ((T%-128)*2)=12/77*%1
0000
9030 NEXT
9040 &=0:b%=2
9050 FOR T%=0 TO 255
9050 Sine?T%=127*SIN(T%/256*2*PI)
9070 IF a%=128 THEN triangle?T%=127 ELS
E triangle?T%=a%
9080 a%+=b%:IF a%>=128 OR a%<=-127 THEN
b%=-b%
9090 IFT%<128 THEN square?T%=127 ELSE s
quare?T%=128
9100 sawtooth?T%=T%
9110 NEXT
9120 PROCPITCHTange
9130 RESTORE +0:18%=0
                                                                                                                                                                                                                                                                                                                                                                                                                                     6699 MOV RO,#80
6700 STR RO,slot
6710 MOV RO,#81
6710 MOV RO,#81
6720 LDR R1,oldslot
6730 SWI "XSOUND_ALTACHVOICE"
6740 MOV RO,#13
6750 MOV R1,#13
6750 MOV R1,#13
6750 MOV R1,#14
6760 SWI "XOS_BYTE"
6780 ADR R1,event
6790 MOV R2,#80
6800 SWI "XOS_RECEBEE"
6810 LDMFD R131,{FC}
6820 :
6810 LDMFD R131,{FC}
6820 :
6830 :envpars FNr(35)
6840 :config FNr(8)
6850 :slot EQUD 0
6870 :
6860 :slot EQUD 0
6870 :
6860 :setupsound
6890 MOV R0,#1
6900 MOV R0,#1
6910 MOV R2,#48
6910 MOV R2,#48
6920 MOV R3,#0
6930 MOV R1,#80
6930 MOV R3,#0
6930 MOV R4,#0
6930 MOV R3,#0
                                                                                                                                                                                                                                                                                                                                                                                                                                               6700 STR RØ, slot
         5570 :
5580 .gateon
5590 ADR RØ,sampleptr
         5600 LDMIA RØ, (RØ-R2)
5610 ADD R3, R9, #16
5620 STMIA R3, (RØ-R2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9130 RESTORE +0:B%=0
9140 FOR T%=0 TO 127:keytable?T%=255:NE
         5630 .update
5640 LDR RØ, (R9,#4)
5650 MOV RØ,RØ,LSL #16
5650 MOV RØ,RØ,LSR #18
5670 STR RØ, (R9,#4)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9150 REPEAT
9160 READ A%
9170 IF A%>0 THEN keytable?A%=B%:E%+=1
9180 UNTIL A%=0
9190 SYS '0S_CRC',0,code%,P%,1 TO crc%
9200 IF crc%<>663AA THEN PRINT"Checksum
wrong - check the listing from 'DEF PRO
Cinitcode' to 'EMPEROC'':END
9210 !sampleptr=buffor%
9220 !sampleptr=buffor%
9220 !sampleptr=scalelookup
9240 !sourcewaveptr=sine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8040 LDR R9, [R7]
8050 ADD R9, R9, R6
8060 STR R9, [R7], #4
8070 ADD R4, R4, R5
8080 SUBS R8, R8, #1
8090 BNE waveloop
8100 ADD R5, R5, #1<<24
         5730 :
5740 .fillloop
5750 ]:FOR T%=0 TO 3:[OPT PASS
5760 ADDS R1,R1,R1,LSL #16
                                                                                                                                                                                                                                                                                                                                                                                                                                             693Ø MOV R4,#Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                          6940 SWI "XSound_Configure"
6950 ADR R1,config
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8110 SUBS R2,R2,#1
8120 BNE harmonicloop
```



→ 9250 !fileptr=file% 9260 !pitchtableptr=pitchtable 9270 FOR T%=2 TO 8:SYS "Sound\_AttachVoi ce",T%,Ø TO ,voice%(T%):NEXT

9280 CALL setupsound 9290 FOR T%=1 TO 8:VOICE T%, "TestVoice2 ":NEXT 9300 ENDFROC

9310 : 9320 DATA &4E,&3D,&4F,&3E,&50,&51,&40,& 52,&41,&53,&42,&54 9330 DATA &27,&12,&28,&13,&29,&2A,&15,&

2B,&16,&2C,&17,&2D 9340 DATA &2E,&19,&2F,&1A,&30 9350 DATA 0 9360; 9370 DEF FNr(i%):P%+=i%:=""

#### \*INFO

isting 1 - WetSrc	1080 LDX colour 1090 LDY #0	2180 LDA east 2190 BNE noteast 2200 JMP moveast	3280 EQUD &33333F3F:EQUD &3033333 3290 EQUD &37373F3F:EQUD &3173737 3300 :
10 REM >WetSrc (Info1)	1100 LDA (write),Y 1110 AND #&AA	2210 .noteast	3310 .showvalve
20 REM By Richard T-W and Matthew G 30 REM For eight-bit machines 40 REM (c) BBC Acorn User July 1992 50:	1120 ORA cols2,X 1130 STA (write),Y	2220 LDA west 2230 BNE notwest	3320 LDA valvex,X 3330 STA px
40 REM (c) BBC Acorn User July 1992	1140 LDX tempx	2240 JMP movewest	3340 LDA valvey, X 3350 STA py
50 : 60 MODE 7	1160 :	2250 .notwest 2260 LDA north	
70 PRINT "Assembling code";	1170 .unplot	2270 BNE nextdot 2280 DEC y%, X	3370 PHA
80 PROCassemble 90 PROCsave	1180 STX tempx 1190 JSR addr	2290 DEC Y5,X 2290 LDA #&FF	3390 PLA
		2300 STA upflag%,X 2310 .nextdot	3400 TAX
10 : 120 DEF PROCassemble	1210 .1ercpix2 1220 LDY #0	2320 LDA OX	3420 BMI ignore
130 x% = &2400	1230 LDA (write),Y	233Ø STA px	3430 BEQ print
140 y% = &2500 150 onscr% = &2600	1250 STA (write),Y	2340 LDA OY 2350 STA PY	3450 LDA #0
.60 col% = &2700	1260 LDX tempx	2360 JSR unplot 2370 LDA x%,X	3460 .delvalvel
70 upriag% = &2800 80 xtablo% = &2900	1280 .rightpix2	2380 STA px	3480 DEY
90 xtabhi% = &2980	1290 LDY #0	2390 LDA y%, X	3490 BPL delvalvel
00 ytablo% = &2A00 10 ytabhi% = &2B00	1300 LDA (Write),Y 1310 AND #&AA	2400 STA py 2410 LDA co1%,X	3510 STA valveflag,X
20 rndtab% = &2C00	1320 STA (write),Y	2420 STA colour	3520 .ignore
30 code% = &2D00 40 :	1330 LDX tempx 1340 RTS	2430 JSR plot 2440 .pastdot	3540 .print
50 FOR N%=0 TO 127	1350 :	2450 INX	3550 LDY #31
60 A%=(N% AND 254)*4 70 ytablo%2N% = A% MOD 256	1360 .point 1370 STX tempx	2460 BEQ notfor 2470 JMP foreach	3570 LDA valve,Y
80 xtabhi%?N% = A% DIV 256	1380 JSR addr	2480 .notfor	3580 STA (write),Y
90 NEXT	1390 BNE rightpix3	2490 JSR keycheck 2500 BIT escflag	3590 DEY 3600 BPL print2
00 END 10: 120 DEF PROCASSEMBLE 30 X* = £2400 40 y* = £2500 50 onscr* = £2600 60 col% = £2700 70 upflag% = £2800 80 xtablo% = £2700 90 ytablo% = £2800 10 ytabli% = £2800 10 rows = £2000 10 row	1410 LDX tempx	2510 BMI end	3610 LDA valvecol,X
20 A%=&3040+(N% DIV 8)*640+(N% AND 7) 30 ytablo%2N% = A% MOD 256	1420 LDY #0 1430 LDA (write).Y	2520 JMP start 2530 .end	3360 TXA 3370 PBA 3380 JSR addr 3390 PLA 3400 TAX 3410 LDA valveflag, X 3410 LDA valveflag, X 3420 EMI ignore 3430 EEQ print 3440 LDY #31 3450 LDA #0 3460 .delvalvel 3470 STA (write), Y 3480 EEY 3490 EPL delvalvel 3500 LDA #0 3510 STA valveflag, X 3520 .ignore 3530 RTS 3540 .print 3550 LDY #31 3560 .print2 3570 LDA valve, Y 3590 EEY 3590 EEY 3590 EEY 3600 EPL print2 3610 LDA valvecol, X 3620 STA colour 3630 CLC 3640 LDA valvex, X 3650 ADC #2 3660 STA pX 3670 STA pX 3670 STA pX 3700 STA pY 3710 TXA 3720 FBA 3730 JSR plot 3740 JSR plot 3750 JSR plot 3760 LDA #1 3790 STA valveflag, X 3800 RTS 3800 LDA #1 3790 STA valveflag, X 3800 RTS 3810 : 3820 .valvecol 3820 EQUD &87066382 3840 .keytab 3850 EQUB 32 \ 60 3860 EQUB 113 \ 61 3870 EQUB 14 \ 12 3880 EQUB 113 \ 61 3890 : 3890 .keycheck 3910 LDA #32 3930 JSR obbyte 3940 .keyflag 3890 .keypress 3960 LDA #3 3970 STA px 3970 STA
40 ytabhi%?N% = A% DIV 256	1440 AND #EAA	2540 RTS	3640 LDA valvex,X
50 NEXT	1450 RTS	2550 : 2560 .newdot	3650 ADC #2 3660 STA px
70 FOR N%=0 TO &FF STEP 4	1470 LDX tempx	2570 ORA dotmade	3670 CLC
80 rndtab%!N% = RND	1480 LDY #0	2580 BNE pastdot 2590 LDA #aFF	3680 LDA valvey,X
90 NEAT	1500 AND #£55	2600 STA dotmade	3700 STA py
10 px=&70	1510 RTS	2610 STA onser%, X	3710 TXA
20 py=&71 30 read=&72	1520 : 1530 .cols1	2620 JSR rnd 2630 AND tapwidth	3730 JSR plot
AD MITCE-8/4	1340 DODD WARDONSON	264Ø CLC	3740 INC py
50 colour=&76 60 rndptr=&77	1550 EQUD &2A282220 1560 .cols2	2650 ADC tapx 2660 STA x%,X	3760 DER PLOC 3760 PLA
70 tempx=&78	1570 EQUD &5040100	2670 STA OX	3770 TAX
80 north=&79 90 south=&7A	1580 EQUD &15141110 1590 :	2680 LDA #0 2690 STA y%,X	3790 STA valveflag.X
00 east=&7B	1600 .setup	2700 STA oy	3800 RTS
10 west=&7C 20 dotmade=&7D	1610 LDX #0 1620 .resetloop	2710 BNE nextdot 2720 :	3820 .valvecol
30 ox=&7E	1630 LDA #0	2730 .fall	3830 EQUD &07060302
40 oy=&7F 50 tapx=&80	1640 STA onscr%,X 1650 STA upflag%,X	2740 LDA upflag%,X 2750 BNE clear	3840 .keytab 3850 EOUB 32 \f0
60 tapwidth=&81	1660 JSR rnd	2760 INC y%, X	3860 EQUB 113 \f1
70 valvex=&82 80 valvey=&86	1670 AND #1 1680 ASL A	2770 BNE nextdot 2780 .clear	3870 EQUB 114 \f2 3880 EQUB 115 \f3
90 valveflag=&8A	1690 CLC	2790 LDA east	3890 :
00 keyflag=&8E 10 osbyte=&FFF4	1700 ADC #4 1710 STA col%,X	2800 BEQ clear2 2810 LDA west	3900 .keycheck
20 escflag=&FF	1720 INX	2820 BEQ clear2	3920 LDX #32
30 : 40 FOR N%=0 TO 2 STEP 2	1730 BNE resetloop 1740 RTS	2830 LDA north 2840 BNE nextdot	3930 JSR osbyte
50 P%=code%	1740 KIS 1750 :	2850 DEC Y%,X	3950 BPL keypress
60 [OPT N%	1760 .start	2860 BNE nextdot 2870 .clear2	3960 LDA #0
70 JMP setup 80 JMP start	1770 LDA #0 1780 STA dotmade	2880 LDA #0	3980 .keypress
90 JMP dotremove	1790 LDX #0 1800 .foreach	2890 STA upflag%,X	3990 LDX #3 4000 .testkeys
00 JMP showvalve 10 :	1810 LDA onscr%,X	2900 BEQ nextdot 2910 :	4010 CMP keytab,X
20 .rnd	1820 BNE olddot	2920 .randlr	4020 BNE notpressed
30 LDY rndptr 40 LDA rndtab%,Y	1830 JMP newdot 1840 .olddot	2930 JSR rnd 2940 BPL movewest	4030 PHA 4040 LDA keyflag
50 EOR &FE44	1850 LDY x%,X	2950 :	4050 BNE lastpress
60 STA rndtab%,Y 70 INC rndptr	1860 STY OX 1870 INY	2960 .moveast 2970 INC x%,X	4060 JSR showvalve 4070 LDA #&FF
80 RTS	1880 STY px	2980 JMP nextdot	4080 STA keyflag
90 : 00 .addr	1890 LDA Y%, X 1900 STA oy	2990 : 3000 .movewest	4090 .lastpress 4100 PLA
10 LDX px	1910 STA py	3010 DEC x%,X	4110 .notpressed
20 LDY py 30 CLC	1920 JSR point 1930 STA east	3020 JMP nextdot 3030 :	4120 DEX 4130 BPL testkeys
40 LDA xtablo%,X	1940 DEC px	3040 .divide	4140 RTS
50 ADC ytablo%,Y 60 STA write	1950 DEC px 1960 JSR point	3050 LDA col%,X 3060 CMP #4	4150 ] 4160 NEXT
70 LDA xtabhi%,X	1970 STA west	3070 BEQ moveast	4170 ENDPROC
80 ADC ytabhi%,Y 90 STA write+1	1980 INC px 1990 DEC py	3080 BNE movewest 3090 :	4180 : 4190 DEF PROCSAVE
00 LDA px	2000 JSR point	3100 .dotremove	4200 PRINT ""Code assembled."
10 AND #1 20 RTS	2010 STA north 2020 INC py	3110 LDX #0 3120 .dot1p	4210 PRINT ''"Saving :" 4220 osc\$="SAVE WaterMC "+STR\$"xtab
30 :	2030 INC py	3130 LDA onscr%,X	" "+STR\$"P%
40 .plot 950 STX tempx	2040 JSR point 2050 STA south	3140 BEQ nodel 3150 LDA x%,X	4230 PRINT'"*"; osc\$ 4240 OSCLI (osc\$)
960 JSR addr	2060 BNE nfall	3160 STA px	4250 ENDPROC
70 BNE rightpix	2070 JMP fall	3170 LDA Y%,X 3180 STA DY	Listing 2 – WaterEd
980 .leftpix 990 LDX colour	2080 .nfall 2090 AND #&C0	3190 JSR unplot	
000 LDY #0	2100 BEQ notdivide	3200 .nodel	10 REM >WaterEd (Info2) 20 REM By Richard T-W and Matthew
010 LDA (write),Y 020 AND #&55	2110 JMP divide 2120 .notdivide	3210 INX 3220 BNE dotlp	30 REM For eight-bit machines
030 ORA cols1,X	2130 LDA east	3230 RTS	40 REM (c) BBC Acorn User July 19
040 STA (write),Y 050 LDX tempx	2140 ORA west 2150 BNE notrand	3240 : 3250 .valve	50 : 60 IF PAGE>&1100:PAGE=&1100:CHAIN
	2160 JMP randlr	3260 EQUD &202173F:EQUD &3030202	terEd"

```
80 HIMEM=&2400
90 VDU 23;8202;0;0;0;19,15,2;0;
                                                                                                                                                                                                                                                                                                                                                                                                                                          ENE
EMOTE
LDR
TST
BEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 doitloop
                                                                                                                                                                                                                                                                                                                                                                                                      1880
1890
1900
1910
1920
1930
1940
                                                                                                                                      1220 oy%=cury%
1230 PROCmove
                                                                                                                                                                                                                                                                                                         LDMFD
                                                                                                                                                                                                                                                                                                                                (sp)!, (rØ-r2,pc)^
                                                                                                                                                                                                                                                                        830
        110 CALL setup
                                                                                                                                      1240 MOVE 8x%, 8y%; DRAW 0x%, 0y%
                                                                                                                                 1240 MOVE Syk, syk:DRAM Oxk, oyk
1250 MOVE Syk, syk:DRAM curxk, curyk
1260 UNTIL INKEY-87
1270 GCOL 0,colk
1280 MOVE Syk, syk:DRAW curxk, curyk
1290 GCOL 3,7
1300 REPEAT UNTIL NOT INKEY-87
1310 ENDPROC
1320:
1330 DEF PROCValve(numk)
1340 IF curxk:16 OR curxk>943 OR curyk>
991 OR curyk-32 ENDPROC
1350 LOCAL Xk
1360 Xk=numk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                r0,#1
waitonemore
r8,#0
r0,[r7,#IOCIRQMSKB
                                                                                                                                                                                                                                                                        85Ø
86Ø
87Ø
                                                                                                                                                                                                                                                                                                                               (sp)!, (r0-r3, link)
r14, #IOC
r0, #1<<device_time
        120 PROCECTEE
        130 ON ERROR PROCETTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                          TEQP
        140 REPEAT
150 *FX 229,1
       160 PROCdesign
170 *FX 229,0
180 CALL start
                                                                                                                                                                                                                                                                        880
                                                                                                                                                                                                                                                                                                                                                                                                      1950
                                                                                                                                                                                                                                                                                                                               rø, [r14, #IOCIROCLR
                                                                                                                                                                                                                                                                                                                                                                                                                                           ORR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rø, rø, #%11000000
rø, [r7, #IOCIRQMSKB
                                                                                                                                                                                                                                                                  Al
                                                                                                                                                                                                                                                                                                                                                                                                      1960
                                                                                                                                                                                                                                                                                                                                                                                                                                          STRB
                                                                                                                                                                                                                                                                        890
                                                                                                                                                                                                                                                                                                        LDR
                                                                                                                                                                                                                                                                                                                               r3,hline
       188 CALL start
199 UNTIL FALSE
200 END
210:
220 DEF PROCINIT
230 OSCLI "Load WaterMC 2900"
240 setup=£2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                r9,#0
r1,#256-84
inkey
r1,#1
r1,speed
r1,#256-82
inkey
                                                                                                                                                                                                                                                                                                                                                                                                      1970
                                                                                                                                                                                                                                                                                                        ADDS
                                                                                                                                                                                                                                                                                                                               r3,r3,#1
r3,r3,#255
r3,hline
                                                                                                                                                                                                                                                                        900
                                                                                                                                                                                                                                                                                                                                                                                                                                          TEOP
                                                                                                                                                                                                                                                                                                         AND
                                                                                                                                                                                                                                                                                                                                                                                                      1980
                                                                                                                                                                                                                                                                                                                                                                                                                                           MOV
                                                                                                                                                                                                                                                                        920
                                                                                                                                                                                                                                                                                                                                                                                                       1990
                                                                                                                                                                                                                                                                        930
                                                                                                                                                                                                                                                                                                         LDR
                                                                                                                                                                                                                                                                                                                                r1,off
                                                                                                                                                                                                                                                                                                                                                                                                      2000
                                                                                                                                                                                                                                                                                                                                                                                                                                           MOVEO
                                                                                                                                                                                                                                                                                                                             r1,off
r0,r3,#128
r0,r0,#0
r0,r0,r1,LSL #1
r1,#1604
r1,r1,#1
r0,r0,r1
r1,table
r14,r1,r0,LSL #3
r14,(r1,r14)
r3,r3,#3
r3,r3,USL #1
                                                                                                                                                                                                                                                                                                                                                                                                                                          MOVEQ
STREQ
MOV
BL
MOVEQ
STREQ
MOV
                                                                                                                                                                                                                                                                        940
                                                                                                                                                                                                                                                                                                         RSBS
                                                                                                                                                                                                                                                                                                                                                                                                      2010
                                                                                                                                     1360 X%=num%
                                                                                                                                                                                                                                                                        950
                                                                                                                                                                                                                                                                                                         RSBMI
                                                                                                                                                                                                                                                                                                                                                                                                      2020
                                                                                                                                     1370 IF INKEY-1 PROCunvalve(num%): ENDPR
       25Ø start=&2DØ3
                                                                                                                                                                                                                                                                        960
                                                                                                                                                                                                                                                                                                        SUB
MOV
SUB
AND
ADR
ADD
LDMIA
AND
MOV
ORR
       260 remove=&2D06
                                                                                                                                     1380 IF valveflag?num%=255 valveflag?nu
       270 showvalve=&2D09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 r1, speed
r1, #256-113
       28Ø tapx=&8Ø
                                                                                                                                     N=0
1399 IF valveflag?num%=1 CALL showvalve
1400 valvex?num%=(curx% DIV 8) AND &FE
1410 valvey?num%=((1023-cury%) DIV 4) A
        290 width=&81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 inkey
r8,#Ø
        300 valvex=&82
                                                                                                                                                                                                                                                                                                                                                                                                      2Ø8Ø
2Ø9Ø
        310 valvey=&86
320 valveflag=&8A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rø, [r7, #IOCIROMSKB
     320 valveflag=68A
330 ?tapx=63
340 ?width=0
350 !valveflag=-1
360 ENDPROC
370 :
380 DEF PROCscreen
390 VDU 29,128;0;
400 GCOL 0,7
410 MOVE 0,0
                                                                                                                                   ND 4F8
1420 CALL showvalve
1430 ENDPROC
1440:
1450 DEF PROCUNVALVe(num%)
1460 IF valveflag?num%=255 ENDPROC
1470 IF valveflag?num%=1 CALL showvalve
1460 valveflag?num%=255
1490 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rø, rø, #%11000000
                                                                                                                                                                                                                                                                                                                                r1,r1,r3,LSL #26
                                                                                                                                                                                                                                                                                                                                                                                                     2110
                                                                                                                                                                                                                                                                                                                                                                                                                                          STRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 rø, [r7, #IOCIROMSKB
                                                                                                                                                                                                                                                                     1060
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                                r2, #VIDC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                r9,#0
r1,#255
doitloop
r8,#0
r0,[r7,#IOCIRQMSKA
                                                                                                                                                                                                                                                                                                                                                                                                      2120
                                                                                                                                                                                                                                                                     1070
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                                rø, #&FFØ
                                                                                                                                                                                                                                                                                                                                                                                                                                          TEOP
                                                                                                                                                                                                                                                                     1080
                                                                                                                                                                                                                                                                                                        ORR
                                                                                                                                                                                                                                                                                                                               rØ, rØ, #&ØØF+(8<<26
                                                                                                                                                                                                                                                                                                                                                                                                      2130
                                                                                                                                                                                                                                                                                                                                                                                                                                          CMP
BNE
                                                                                                                                                                                                                                                                                                                                                                                                      2140
                                                                                                                                                                                                                                                                                                                              r1,[r2]
r1,r1,r0
                                                                                                                                                                                                                                                                     1090
                                                                                                                                                                                                                                                                                                        STR
                                                                                                                                                                                                                                                                     1100
                                                                                                                                                                                                                                                                                                                                                                                                     2160
                                                                                                                                                                                                                                                                                                                              r1,r1,r0
r1,[r2]
r3,r3,#1
r1,r14,r3,LSL #26
r1,[r2]
r1,r1,r0
r1,[r2]
(sp)] (r0,r3,r0)
                                                                                                                                                                                                                                                                     1110
                                                                                                                                                                                                                                                                                                        STR
ADD
ORR
STR
EOR
STR
                                                                                                                                 Listing 3 - IntDemo
        420 DRAW 0, 102
                                                                                                                                                                                                                                                                                                                                                                                                      217ø
                                                                                                                                                                                                                                                                                                                                                                                                                                          BIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                r0, r0, #(1<<timer1_
       430 DRAW 1023,1023
440 DRAW 1023,0
                                                                                                                                        10 REM >IntDemo (Info3)
20 REM By DAVid Acton
30 REM 32-bit only
40 REM (c) BBC Acorn User July 1992
50 :
60 MODE 12
70 OFF
80 PROCdemo_screen
100 PDOCdemo_screen
                                                                                                                                                                                                                                                                                                                                                                                                  bit)
218Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                          STRB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                rØ, [r7, #IOCIROMSKA
     450 DRAW 0,0
468 GCDL 0,0
470 MOVE ?tapx*8,1023
480 FLOT 1,?width*8,0
500 FLOT 1,?width*8,0
510:
520 title$="WATERWORLD"
530 FOR loop*=1 TO LEN(title$)
540 COLOUR loop* MOD 7+1
550 PRINT TAB(0,loop**2+3),MID$(title$)
loop*,1)
       450 DRAW 0.0
                                                                                                                                                                                                                                                                                                        LDMFD
                                                                                                                                                                                                                                                                                                                               (sp)!, {r0-r3,pc}^
                                                                                                                                                                                                                                                                                                                                                                                                                                                                rø, [r7, #IOCIROMSKB
                                                                                                                                                                                                                                                                                                                                                                                                     2200
                                                                                                                                                                                                                                                                                                                                                                                                                                          STRB
                                                                                                                                                                                                                                                                                                                                                                                                      2210
                                                                                                                                                                                                                                                                     1190
                                                                                                                                                                                                                                                                                                                                                                                                                                          TEOP
                                                                                                                                                                                                                                                                                                                             (sp)!, {r0,r1,link}
r1,#IOC
r0,[r1,#Timer1LL]
r0,r0,ASR #8
r0,[r1,#Timer1LH]
r0,[r1,#Timer1GO]
(sp)!, {r0,r1,pc}
                                                                                                                                                                                                                                                                                                        STMFD
                                                                                                                                                                                                                                                                     1200
                                                                                                                                                                                                                                                                                                                                                                                                                                          MOVNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                rØ,#device_vsync
r1,event_start
r2,#Ø
"XOS_ReleaseDevice
                                                                                                                                                                                                                                                                     1210
                                                                                                                                                                                                                                                                                                        MOV
STRB
                                                                                                                                                                                                                                                                                                                                                                                                      2230
                                                                                                                                                                                                                                                                                                                                                                                                                                          MOV
                                                                                                                                                                                                                                                                     1220
                                                                                                                                                                                                                                                                                                                                                                                                     2240
                                                                                                                                                                                                                                                                                                                                                                                                                                          ADR
                                                                                                                                        100 PROCrand_colours
110 CALL calibrate
                                                                                                                                                                                                                                                                     1230
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                                                                                                     2250
                                                                                                                                                                                                                                                                                                        STRB
                                                                                                                                                                                                                                                                     1240
                                                                                                                                                                                                                                                                                                                                                                                                     2260
                                                                                                                                                                                                                                                                                                                                                                                                                                          SWI
                                                                                                                                       120 !each=8*!total/312.5
                                                                                                                                                                                                                                                                                                                                                                                                  2250
Vector'
2270
2280
2290
2300
                                                                                                                                                                                                                                                                     1250
                                                                                                                                                                                                                                                                                                        STRB
                                                                                                                                                                                                                                                                                                                                                                                                                                         MOV
ADR
MOV
SWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                rØ,#device_timer1
r1,event_swap
r2,#0
"XOS_ReleaseDevice
  ,loop%,1)
560 PRINT TAB(19,loop%*2+3);MID$(title
                                                                                                                                        130 CALL doit
                                                                                                                                                                                                                                                                     1260
                                                                                                                                        14Ø END
 $,100p%,1)
                                                                                                                                     150 :
160 DEF PROCASS
170 DIM code% &4000
180 device_vsync=3
190 device_timerl=6
200 IOC=£03200000
210 VIDC=£03400000
220 IOCIROSTAN=£10
230 IOCIROREQA=£14
240 IOCIROCURA=£14
     570 NEXT
580 ENDPROC
                                                                                                                                                                                                                                                                                                        STMFD
                                                                                                                                                                                                                                                                                                                             (sp)!, (rØ-r12, link
                                                                                                                                                                                                                                                                                                                                                                                                    Vector
2310
     590 :
600 DEP PROCETTOR
610 IF ERR=17 AND NOT INKEY-1 ENDPROC
620 *FX 229,0
630 *FX 15
640 VDU 22,7
650 PERINT " at line ";ERL
670 END
680 :
680 EF PROCECOL
      590
                                                                                                                                                                                                                                                                                                        MOV
ADR
MOV
SWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                (sp)!, (rØ-r12,pc)
                                                                                                                                                                                                                                                                                                                                                                                                                                         LDMFD
                                                                                                                                                                                                                                                                                                                             r1, event_vsync
r2, #0
"XOS_Claim"
                                                                                                                                                                                                                                                                                                                                                                                                     2320
                                                                                                                                                                                                                                                                                                                                                                                                                   .inkey
                                                                                                                                                                                                                                                                                                                                                                                                                                                               (sp)!, (link)
rØ,#129
r2,#255
"XOS_Byte"
r1,#255
                                                                                                                                                                                                                                                                                                                                                                                                     2340
                                                                                                                                                                                                                                                                                                                                                                                                                                          STMFD
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                              rØ,#14
r1,#4
                                                                                                                                                                                                                                                                    1350
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                                                                                                      2360
                                                                                                                                                                                                                                                                                                                                                                                                                                          MOV
                                                                                                                                      240 IOCIRQCLRA=&14
250 IOCIRQMSKA=&18
260 IOCIRQMSKB=&28
                                                                                                                                                                                                                                                                    1360
                                                                                                                                                                                                                                                                                                        SWI
                                                                                                                                                                                                                                                                                                                                "XOS_Byte
                                                                                                                                                                                                                                                                                                                                                                                                     2370
                                                                                                                                                                                                                                                                                                        MVN
                                                                                                                                                                                                                                                                                                                               rø.#2
                                                                                                                                                                                                                                                                                                                                                                                                     2380
                                                                                                                                                                                                                                                                                                        STR
                                                                                                                                                                                                                                                                                                                              rø, frame
                                                                                                                                                                                                                                                                                                                                                                                                     2390
                                                                                                                                                                                                                                                                                                                                                                                                                                          LDMFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                (sp)!, {pc}
                                                                                                                                       270 Timer1LL=&50
     690 DEF PROCCOL
                                                                                                                                                                                                                                                                                                                                                                                                                   .total
.each
.time
.hline
.frame
                                                                                                                                                                                                                                                                                                                                                                                                                                        EQUD
EQUD
EQUD
EQUD
                                                                                                                                       280 Timer1LH=&54
                                                                                                                                                                                                                                                                    1400
                                                                                                                                                                                                                                                                                                        LDR
                                                                                                                                                                                                                                                                                                                             rø, frame
      700 COLOUR 128+col%
                                                                                                                                                                                                                                                                                                                             r0, rame
r0, #0
wait_until_zero
r2, #0
                                                                                                                                       290 Timer1G0=&58
                                                                                                                                                                                                                                                                    1410
1420
      710 FOR N%=0 TO 19 STEP 19
720 PRINT TAB(N%, 29)" "TAB(N%, 30)" ";
                                                                                                                                       300 Timer1CL=&50
                                                                                                                                                                                                                                                                                                        MOV
OOD
LDR
CMP
                                                                                                                                                                                                                                                                    1440
1450
1460
1470
1480
       73Ø NEXT
                                                                                                                                       320 Timer1LR=&5C
                                                                                                                                      320 TimerlLH=5C

330 EventV=10

340 timerl_bit=6

350 vsync_bit=3

350 sp=13:link=14:pc=15

370 FOR pass%=0 TO 2 STEP 2

380 P%=code%

390 WHILE P% MOD 1600
       740 COLOUR 128
                                                                                                                                                                                                                                                                                                                                                                                                                   .off
                                                                                                                                                                                                                                                                                                                                                                                                                                         EQUD
       750 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                  .wasb
                                                                                                                                                                                                                                                                                                                               rl, rø
                                                                                                                                                                                                                                                                                                                              count_loop
 760 :
770 DEP PROCmove
780 speed%=4-12*INKEY-1
790 curr%=curr%+INKEY-90*speed%-INKEY-67*speed%
880 curr%=curr%+INKEY-105*speed%-INKEY-13*speed%-INKEY-105*speed%-INKEY-13*speed%-INKEY-105*speed%-INKEY-13*speed%-INKEY-105*speed%-INKEY-13*speed%-INKEY-105*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*speed%-INKEY-13*s
                                                                                                                                                                                                                                                                                                        BEQ
LDR
                                                                                                                                                                                                                                                                                                                                                                                                     248Ø
                                                                                                                                                                                                                                                                                                                                                                                                                  .speed EOUD
                                                                                                                                                                                                                                                                                                                              r3, time
r2, r2, r3
                                                                                                                                                                                                                                                                                                                                                                                                     2490
                                                                                                                                                                                                                                                                                                                                                                                                     2500 table=P%:P%+=1024*4
                                                                                                                                                                                                                                                                    1490
                                                                                                                                                                                                                                                                                                        ADD
                                                                                                                                       380 P%=code%
390 WHILE P% MOD 16>0
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                               rØ, r1
rØ, #8
                                                                                                                                                                                                                                                                                                                                                                                                     2510 NEXT pass%
                                                                                                                                                                                                                                                                    1510
                                                                                                                                                                                                                                                                                                        CMP
                                                                                                                                                                                                                                                                                                                                                                                                     252Ø ENDPROC
                                                                                                                                      400 P%+=4
410 ENDWHILE
                                                                                                                                                                                                                                                                                                        BNE
                                                                                                                                                                                                                                                                                                                               count loop
                                                                                                                                                                                                                                                                                                                                                                                                 2530 :
2540 DEF PROCdemo_screen
2550 DIM 1%(2),n%(2)
2550 VDU 13,2,%11000001,%11001110,%111
0001,%11111110,%11000001,%11001110,%111
0001,%11111110
2570 SYS "XFORT_FINDFORT",,"Trinity.Bol
d",40*16,40*16,0,0 TO hand%;0%*
2580 IF (ok% AND 1)>0 hand%=0
2590 IF hand%>0 THEN
2600 SYS "Fort_SetFort",hand%
2610 SYS "Fort_SetFortColours",hand%,8,8,0
                                                                                                                                                                                                                                                                                                                                                                                                     2530
    73*speed%
810 IF curx%<8 curx%=8
820 IF curx%>1015 curx%=1015
830 IF curx%>4 curx%=4
840 IF cury%>1019 cury%=1019
850 IF INNEY-49 col%=7:PROCcol
860 IF INNEY-59 col%=5:PROCcol
870 IF INNEY-13 AND INNEY-1 PROCerror
                                                                                                                                                                                                                                                                                                        STR
                                                                                                                                                                                                                                                                                                                               r2.total
                                                                                                                                                                                                                                                                                                                             r2,total
r0,#13
r1,#4
"XOS_Byte"
r0,#Eventv
r1,event_vsync
r2,#0
"XOS_Release"
(sp)!,(r0-r12,pc)
                                                                                                                                      420 [OPT pass%
                                                                                                                                                                                                                                                                    1540
                                                                                                                                                 .event vsvn
                                                                                                                                                                                                                                                                    1550
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                       MOV
SWI
MOV
ADR
MOV
SWI
LDMFD
                                                                                                                                      440
                                                                                                                                                                       STMFD
                                                                                                                                                                                           (sp) | . (rØ-r12, link
                                                                                                                                                                                                                                                                    1560
                                                                                                                                      450
                                                                                                                                                                                              rø.#4
                                                                                                                                                                                                                                                                    1580
                                                                                                                                                                      CMF r0,#4
LDMNEFD (sp)!,(r0-r12,pc)^
MOV r14,#IDC
STRB r0,[r14,#Timer1LR]
LDRB r1,[r14,#Timer1CL]
LDRB r2,[r14,#Timer1CL]
LDRB r1,r1,#2,LSL #8
RSB r1,r1,#2,LSL #8
STR r1,time
MVN r0,#0
                                                                                                                                                                                                                                                                  1580
1590
1600
1610
1620
1630 .doit
                                                                                                                                      460
     880 ENDPROC
    896 :
906 DEP PROCdesign
916 GCOL 3,7
920 curx%=512
930 curx%=512
940 col%=7
950 PROCcol
960 PLOT 69,curx%,cury%
970 REPRAT
980 ox%=curx%
                                                                                                                                                                                                                                                                                                        STMFD
                                                                                                                                                                                                                                                                                                                             (sp)!, {r@-r12, link
                                                                                                                                                                                                                                                                                                                             rø, #device vsync
                                                                                                                                                                                                                                                                                                                                                                                                    2620 ELSE
                                                                                                                                                                                                                                                                    1650
                                                                                                                                                                                                                                                                                                        ADR
                                                                                                                                                                                                                                                                                                                               r1, event_start
r2, #Ø
                                                                                                                                                                                                                                                                                                                                                                                                    2630
                                                                                                                                                                                                                                                                                                                                                                                                                    VDU 5
                                                                                                                                                                                                                                                                                                                                                                                                    2640 GCOL 0,8
2650 VDU 23,17,7,6,28;32;0;
                                                                                                                                                                        MVN
                                                                                                                                                                                              rø, #ø
                                                                                                                                                                                                                                                                    1660
                                                                                                                                                                                                                                                                                                        MOV
                                                                                                                                                                                                                                                                                                                               "XOS_ClaimDeviceVe
                                                                                                                                                                                              set_timer
                                                                                                                                                                                                                                                                                                        SWI
                                                                                                                                                                       BL
LDR
                                                                                                                                                                                                                                                                   1670
                                                                                                                                      560
                                                                                                                                                                                              rø, frame
                                                                                                                                                                                                                                                                                                                                                                                                     2660 ENDIF
                                                                                                                                                                                                                                                                                                                             r0,#device_timer1
r1,event_swap
                                                                                                                                                                                                                                                                                                                                                                                                    2670 PROCMESS (782, "Demonstrating", hand%
                                                                                                                                                                        ADD
                                                                                                                                                                                              rø, rø, #1
                                                                                                                                                                                                                                                                   1680
                                                                                                                                                                                                                                                                                                        MOV
     980 ox%=curx%
                                                                                                                                      580
                                                                                                                                                                                                                                                                   1690
                                                                                                                                                                                                                                                                                                        ADR
                                                                                                                                                                                                                                                                                                                               r1,ev
                                                                                                                                                                                                                                                                                                                                                                                                    2680 PROCmess(512, "colour interrupts", h
    990 oy%=cury%
1000 PROCmove
                                                                                                                                      59Ø
                                                                                                                                                                       LDMFD
                                                                                                                                                                                              (sp)!, {r0-r12,pc}
                                                                                                                                                                                                                                                                                                                                                                                                 and%)
2690 PROCMESS(242,"on the Arc", hand%)
2700 IF hand%>0 SYS "Font_LoseFont", han
                                                                                                                                                                                                                                                                  1710
tor"
1720
1730
1740
1750
1760
1770
                                                                                                                                                                                                                                                                                                        SWI
                                                                                                                                                                                                                                                                                                                               "XOS_ClaimDeviceVe
1000 PROCmove
1010 PLOT 69,0x%,0y%
1020 IF INKEY-97 PROClines
1030 IF INKEY-97 GCOL 0,001%;PLOT 69,cu
1x%,cury%;CCOL 3,7
1040 IF INKEY-90 GCOL 0,0:PLOT 69,curx%
                                                                                                                                      610
                                                                                                                                                                    start
                                                                                                                                                                                                                                                                                                                             r7,#IOC
"XOS_EnterOS"
r9,pc
r8,r9,#&@CØØØØØØ
r8,#0
r0,[r7,#IOCIRQMSKA
                                                                                                                                      620
                                                                                                                                                                                              (sp)!, (rØ-r2, link)
r1, #IOC
                                                                                                                                                                                                                                                                                                       MOV
SWI
MOV
ORR
TEQP
LDRB
                                                                                                                                                                                                                                                                                                                                                                                                 2700 IF hand% 9 SYS "Font_LoseFond%
2710 GCOL 3,8
2720 CIRCLE FILL 640,512,500
2730 GCOL 1643,0
2740 RECTANGLE FILL 0,0,1279,1023
                                                                                                                                                                       MOV
                                                                                                                                                                                             r0, #1<<device_vsyn
                                                                                                                                     640
INA, CUTYA:GOOD 3,7

1040 IF INKEY-90 GOL 0,0:PLOT 69,c
,curya:GOOD 3,7

1050 IF INKEY-133 PROCValve(0)

1060 IF INKEY-114 PROCValve(1)

1070 IF INKEY-115 PROCValve(2)

1080 IF INKEY-115 PROCValve(3)

1090 PLOT 69,curxa,curya

1100 UNTIL INKEY-97

1110 PLOT 69,curxa,curya

1120 ENDEROC

1130 :

1140 DEF PROCLines

1150 REPEAT UNTIL NOT INKEY-87

1150 sya-curya

1170 sya-curya

1180 GCOL 3,7

1190 MOVE sxa,sya:DRAW curxa,curya

1200 REPEAT
                                                                                                                                     650
                                                                                                                                                                      STRB
                                                                                                                                                                                             rø, [r1, #IOCIRQCLRA
                                                                                                                                                                      LDR
MOV
STRB
                                                                                                                                                                                             rØ,each
rØ,rØ,LSR #6
rØ,[r1,#Timer1LL]
rØ,rØ,ASR #8
                                                                                                                                     660
670
680
690
700
710
720
730
740
                                                                                                                                                                                                                                                                                                                                                                                                     275Ø ENDPROC
                                                                                                                                                                                                                                                                  178ø
                                                                                                                                                                                                                                                                                                      ORR
                                                                                                                                                                                                                                                                                                                             r0, r0, #1<<timer1_b
                                                                                                                                                                                                                                                                                                                                                                                                     2760
                                                                                                                                                                                                                                                               it
1790
                                                                                                                                                                                                                                                                                                                                                                                                     2770 DEF PROCrand colours
                                                                                                                                                                                                                                                                                                                                                                                                    2780 step%=30
2790 FOR i%=0 TO 1023 STEP step%
2800 IF i%<1024-step% THEN
                                                                                                                                                                                                                                                                                                      STRB
                                                                                                                                                                                                                                                                                                                             rø,[r7,#IOCIRQMSKA
                                                                                                                                                                       MOV
STRB
                                                                                                                                                                                             rø,[rl,#TimerlLH]
rø,[rl,#TimerlGO]
                                                                                                                                                                                                                                                                  1800
                                                                                                                                                                                                                                                                                                                             rø, [r7, #IOCIRQMSKB
                                                                                                                                                                                                                                                                                                      LDRB
                                                                                                                                                                       STRE
                                                                                                                                                                       MOV
                                                                                                                                                                                             rø,#ø
rø,rø,#56+2
                                                                                                                                                                                                                                                                                                                                                                                                    2810
                                                                                                                                                                                                                                                                                                                                                                                                                       n%()=1%()
r%=RND(3)-1
                                                                                                                                                                                                                                                                  1810
                                                                                                                                                                                                                                                                                                      STRB
                                                                                                                                                                       SUB
                                                                                                                                                                                                                                                                                                                                                                                                    282Ø
                                                                                                                                                                                                                                                                                                                                                                                                                     STR
                                                                                                                                                                                             rø, hline
rø, frame
                                                                                                                                                                                                                                                                                                                             rø, rø, #%11100111
rø, [r7, #IOCIRQMSKB
                                                                                                                                                                                                                                                                                                                                                                                                    283Ø
                                                                                                                                                                                                                                                                                                      STRB
                                                                                                                                                                       LDR
                                                                                                                                                                                                                                                                  1830
                                                                                                                                                                                                                                                                                                                                                                                                    2840
                                                                                                                                      760
                                                                                                                                                                      ADD
                                                                                                                                                                                             rø, rø, #1
                                                                                                                                                                                                                                                                                                                                                                                                    2850
                                                                                                                                                                                                                                                                  1840
                                                                                                                                                                       STR
                                                                                                                                                                                             rø, frame
                                                                                                                                                                                                                                                                                                      TEOP
                                                                                                                                                                                                                                                                                                                             r9.#Ø
                                                                                                                                                                                                                                                                                                                                                                                                    2860
                                                                                                                                      780
                                                                                                                                                                       LDR
                                                                                                                                                                                                                                                                   1850
                                                                                                                                                                                                                                                                                 .doitlo
                                                                                                                                                                                                                                                                                                       LDR
                                                                                                                                      790
                                                                                                                                                                       LDR
                                                                                                                                                                                                                                                                    1860
                                                                                                                                                                                                                                                                                                                             rØ,frame
rØ,#1
                                                                                                                                                                                                                                                                                                                                                                                                                   UNTIL n%(r%)<>1%(r%)
ELSE
                                                                                                                                                                                             rø. rø. r1
                                                                                                                                                                                                                                                                                                      TST
```



```
780 b%=RND(2)-1
790 UNTIL 1% OR 9% OR b%
800 FOR 1%=0 TO 15
810 FROCset_col(r%*i%, g%*i%, b%*i%)
820 FOINT 0, 1023
830 g%(i%)=?scr
840 NEXT
850 g%(16)=g%(15)
860 ENDPROC
870:
880 DEF FROCset_col(r%, g%, b%)
890 GCOL (b% AND 12)*4*(g% AND 12)*r%/
4 TINT ((r% OR g% OR b%) AND 3)*64
900 ENDPROC
                                                                                                                                                                                                                                                                                        150 ON ERROR SYS 6,112,s1%:VDU4:ON:REP
ORT:PRINT" at line "STRSERL:END
160 COLOUR 0,0,0,255
170 COLOUR 8,255,192,0
180 COLOUR 9,0,0,0
190 VDU 19,0,24,0,0,255,5
200 REPEAT
210 tid$=RIGHT$(TIME$,8)
220 MAIT
230 SYS 6,112,s1%
240 SYS 6,113,s2%
250 CLS
* 2900 n%()=0

2910 ENDIF

2920 e%=i%+step%

2930 IF e%>1024 e%=1024

2940 FROCscale(i%,e%,1%(0),1%(1),1%(2),

,n%(0),n%(1),n%(2))

2950 1%()=n%()

2960 NEXT

2970 ENDPROC

2980 **
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   400 s$=STR$b%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 400 8$-STR$D\\
410 PROCflip
420 SYS 46,256+34,8pr,8$,0,0,0
430 %=INREY(2)
440 UNTL FALSE
450 :
460 DEF PROCflip
470 SYS 6,112,81\\
480 SYS 6,113,82\\
480 SYS 6,12,81\\
500 CLS
510 SWAP 81\\,82\\
510 SWAP 81\\,82\\
      2980
      2990 DEF PROCecale(i0%,i1%,r1,g1,b1,r2,
                                                                                                                                                                                                                                                                                                      240 SYS 6,113,82%

250 CLS

260 SWAP 81%,82%

270 t%=0

280 w%=(w%+5) MOD 360

290 v%=(v%+20) MOD 360

300 x%=(-16*LEN(title$))/2-16

310 GCU 8

310 FOR n%=1 TO LEN(title$)

330 MOVE x%+16*n%,20*SINRAD(v%+p%*n%)+

30
   2990 DBF PROCSCALE(10%,11%,r1,q1,b1,r2,q2,b2)
3000 LOCAL i%,dr,dg,db
3010 dr=(r2-r1)/(i1%-10%)
3010 dr=(r2-r1)/(i1%-10%)
3010 dr=(b2-b1)/(i1%-10%)
3010 PGR i%=10% TO i1%-1
3050 ri%=PRNint(g1-0.25)
3060 gi%=PRNint(g1-0.25)
3070 bi%=PRNint(b1-0.25)
3080 table(10%:%]=r1%+16*gi%+256*bi%
3090 ri%=PRNint(g1+0.25)
3100 gi%=PRInt(g1+0.25)
3110 bi%=PRInt(g1+0.25)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     510 SWAP s1%, s2%
520 ENDPROC
   g2,b2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     530 :
540 DEF PROCa(x,y,z,a,m%)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Listing 8 - BBC-DLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540 DEF PROCa(x,y,z,a,m%)
550 LOCAL X1,y1
560 IF x<3 ENDPROC
570 xl=x+z*sINRAD(a)
580 yl=y-z*COSRAD(a)
580 yl=y-z*COSRAD(a)
590 LINE x,y,x1,y1
610 PROCa(x1,y1,0.35*z,a+6*m%,m%)
610 PROCa(x1,y1,0.35*z,a+6*m%,m%)
630 ENDPROC
640 **COSTAND **COSTAND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10 REM >BBC-DLI (Info8)
20 REM >B Tristram Mabbs
30 REM FOR BBC B/B+
40 REM (C) BAU 1984 & July 1992
50:
60 MODE 6
70 PROCinit_demo
80 PROCest_dlis(pLIs)
90 *KEY 0 LIST|M
100 *FX 138,0,128
110 END
                                                                                                                                                                                                                                                                                           330 MOVE X*110*7%, 20*SINRAD(v*2)
340 PRINT MID$(title$, n%, 1)
350 MEXT
350 FOR n%=6 TO 360 STEP 6
370 r%=390+90*SINRAD(2*n%+%)
380 2%=8
390 GCOL 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      630 ENDERGO
640:
650 DEF PROCS
660 t1%=(t1%+RND(4)) MOD 360
670 t2%=(t2%+RND(4)) MOD 360
680 t3%=(t3%+RND(4)) MOD 360
690 cOLOUR 1,127*(SINRAD(t1%)+1),127*(
SINRAD(t2%)+1),127*(SINRAD(t3%)+1)
760 ENDERGO
                                           r1+=dr
          3140 g1+=dg
3150 b1+=db
                                                                                                                                                                                                                                                                                                         400 IF n% MOD 30=0 z%=24:GCOL 1:t%+=1
410 CIRCLE FILL r%*SINRAD(n%),r%*COSRA
      3150 h1+db
3160 NEXT
3170 ENDPROC
3180:
3190 DEF FMInt(1)
3200 LOCAL i%
3210 i%=1NT(1)
3220 IF i%+0 i%=0 ELSE IF i%>6F i%=6F
3240:
3240:
3250 DEF FROCMess (y%, t%, hand%)
3260 IF hand%=0 THEN
                                                                                                                                                                                                                                                                                          400 CIRCLE FILL 'x*SINRAD(n%), r%*COSRAD(n%), r%
410 CIRCLE FILL 'x*SINRAD(n%), r%*COSRAD
420 IF r%>8 THEN
430 b%=8
440 IF t%>9 b%=16
450 MOVE r%*SINRAD(n%)-b%, r%*COSRAD(n%)
+12
450 GCOL 3
470 FRINT STR$t%
480 ENDIF
490 NEXT
500 tim%=VAL(MIDS(tid$,1,2))
510 tim%=VAL(MIDS(tid$,4,2))
520 min%=VAL(MIDS(tid$,4,2))
530 ock%=VAL(MIDS(tid$,7,2))
540 at%=30*tim%=min%/2+ock%/120
550 at%=6*min%=ock%/10
550 at%=6*min%=ock%/10
550 at%=6*eck%
570 PROCK(1308-90*SINRAD(2*at%+w%), at%,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120 ::
120 ::
130 DEP PROCINIT_demo
140 DIM cols(6),DLIs 50
150 FOR i=0 TO 6
160 READ cols(i)
170 NEXT
180 lineval=£260
190 FOR i=0 TO 17 STEP 3
200 DLISi=4*lineval
210 ?(DLIs+2+i)=(((i/3)AND7)+1) OR £10
210 NEXT
220 NEXT
230 DLISi=TRUE
240 ENDPROC
250 ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Listing 7 - Gouraud
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10 REM >Gouraud (Info7)
20 REM by David Walters
30 REM for 32-bit machines
40 REM (c) BAU July 1992
        3260 IF hand%=0 THEN
3270 MOVE 640-28*LEN(t$),y%+32
3280 PRINT t$
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     50:
60 MODE 15
70 DIM p%(1000,2),g%(20)
80 DIM vdu% 16
90 |vdu%=149
100 vdu%:4=-1
3208 ERINT t$
3209 ELSE
3300 SYS "Font_StringBBox", t$ TO ,,,x
1%,y1%
3310 x1%=x1%+180/72000
3320 y1%=y1%+180/72000
3330 SYS "Font_Paint", t$,16,640-x1%/2
y%=y1%/2
3340 ENDIF
3350 ENDFROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      250 :
260 DATA 2,4,16,2,2,4,2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  270 :
280 DEF PROCSet_dlis(data)
290 A%=135
300 Mode=((USR(&FFF4)AND&FF0000)/&1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       110 SYS "OS_ReadVduVariables", vdu%, vdu
                                                                                                                                                                                                                                                                                                           570 PROCh (230+90*SINRAD(2*at%+w%), at%,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       %+8
120 scr=vdu%!8
130 COLOUR 128+57 TINT 128
140 CLS
150 OFF
150 REPEAT
170 PROCCpalette
180 k%=0
190 PROCCri(RND(639),RND(255),RND(639),RND(255),RND(539),RND(255),RND(539),RND(255),RND(11,FALSE
200 UNTIL FALSE
210 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  310 DIM code FNassemble(0,&C000)
320 A=FNassemble(0,code)
330 A=FNassemble(2,code)
340 A=7data+&A0
350 7data+A
360 data?1=((data?1)+((A AND &F00)/&10
                                                                                                                                                                                                                                                                                                           580 PROCh (320+90*SINRAD (2*am%+w%), am%,
                                                                                                                                                                                                                                                                                                           590 PROCh (350+90*SINRAD (2*as%+w%), as%,
   Listing 4 - CrazyLet
                                                                                                                                                                                                                                                                                                       590 PROCh(350+90*SINRAD(2*as%+w%),)
600 GOL 0
610 CIRCLE FILL 0,0,32
620 GCOL 7
630 CIRCLE 0,0,32
640 CIRCLE FILL 0,0,12
650 UNTIL FALSE
660:
670 DEF PROCh(z%,a%,c%)
680 LOCAL x2%,y2%,x3%,y3%,x4%,y4%
680 LOCAL x2%,y2%,x3%,y3%,x4%,y4%
680 LOCAL x2%,y2%,x3%,y3%,x4%,y4%
710 x3%=z%*COSRAD(a%-6)/2
710 x3%=z%*COSRAD(a%-6)/2
710 x3%=z%*COSRAD(a%-6)/2
710 x3%=z%*COSRAD(a%-6)/2
710 x3%=z%*COSRAD(a%-6)/2
710 GCOL c%
600 MOVE x2%,y2%
710 MOVE x2%,y2%
                    10 REM >Crazylet (Info4)
20 REM by Jan Vibe
30 REM for 32-bit machines
40 REM (c) BAU July 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0)+6)
370 CALL install
380 ENDPROC
30 RRN (c) BAU July 1992
50:
60 MODE 13
70 a$="Archimedes"
80 DIM a1%(20), a2%(20), t1%(20), t2%(20), c%(20), xx%(20), yx%(20)
90 1%=LEN(a5)
100 a1%=1
110 s2%=2
120 FOR n%=1 TO 1%
130 a1%(n%)=RND(360)-1
140 a2%(n%)=RND(360)-1
150 t1%(n%)=RND(17)+3
170 c%(n%)=RND(17)+3
170 c%(n%)=RN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     210 :
220 DEF PROCtri(ax,ay,bx,by,cx,cy,ai,b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      390 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  400 DEF PNassemble(pass,
410 Pk=addr
420 (DFT pass
430 .install
440 SET
450 LDA 2204
460 STA oldIRQ
470 LDA 2205
480 STA oldIRQ+1
490 LDA #newIRQ MOD 256
500 STA 2204
510 LDA #newIRQ DIV 256
520 STA 6205
530 CLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      400 DEF FNassemble (pass, addr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       i.ci)
230 IF ay<by SMAP ax,bx:SMAP ay,by:SMA
P ai,bi
240 IF by<cy SWAP bx,cx:SWAP by,cy:SWA
P bi,ci
250 IF ay<by SWAP ax,bx:SWAP ay,by:SWA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P ai,bi
260 PROCline(cx,cy,bx,by,ci,bi)
270 PROCline(bx,by,ax,ay,bi,ai)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   270 PROCLING(DX,DY,AX,AY,D1,A1)
280 K2%+%
290 PROCLING(CX,CY,AX,AY,CI,AI)
300 POR k*e0 TO k2%-1
310 a=p%(k%,0)
320 b=p%(k%+k2,0)
330 il=p%(k%+k2,0)
330 il=p%(k%+k2,2)
340 i2=p%(k%+k2%,2)
350 IF a-b SMAP a,b:SMAP i1,12
360 ii=1
370 IF a=b is=0 ELSE is=(i2-i1)/(b-a)
380 0%=0
390 0%=0C+640*p%(k%,1)
400 POR j%=a TO b-1
410 ii+is
420 b%=ii/16
420 b%=ii/16
430 0%+=ii-b%*16
                                                                                                                                                                                                                                                                                                           770 MOVE 2%, y2%
780 PLOT 85, x3%, y3%
790 PLOT 85, x4%, y4%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      530 CLI
540 RTS
                                                                                                                                                                                                                                                                                                            800 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540 RTS
550: newIRQ
570 LDA EFC
580 PHA
590 TXA
600 PHA
610 TYA
620 PHA
630 LDA EFE4E
640 AND EFE4E
650 AND LLI
670 LDA GFE4E
680 AND FF4E
680 AND FF4E
200 OFF
210 ON ERROR VDU 4:SYS 6,112,61%:REPOR
T:PRINT" at line "STRSERL:ON:END
220 REPEAT
230 x%=320
240 c%(RND(1%))=RND(63)
250 FOR n%=1 TO 1%
260 a1%(n%)=(a1%(n%)+t2%(n%)) MOD 360
270 a2%(n%)=(a2%(n%)+t2%(n%)) MOD 360
280 xx%(n%)=32*(SINRAD(a1%(n%))+1)+8
290 yx%(n%)=32*(SINRAD(a2%(n%))+1)+8
300 x%=xx%(n%)
310 NETT
                                                                                                                                                                                                                                                                                             Listing 6 - Fern
                                                                                                                                                                                                                                                                                                                10 REM >Fern (Info6)
20 REM by Jan Vibe
30 REM for 32-bit machines
40 REM (c) BAU July 1992
50 :
60 MODE 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       430 e%+=ii-b%+16
440 IF e%>=16 b%+=1:e%=e% AND 15
450 q%?j%=g%(b%)
460 NEXT
                                                                                                                                                                                                                                                                                                            80 OFF
90 s1%=1
100 s2%=2
110 k%=32
           296 yzsimijsz (Sirkani(azsimi))+1)+
300 x%-zxzsimi)
310 NEXT
320 x%-z*x%
330 POR n%=1 TO 1%
340 y%=512+2*yzsimi)
350 MOVZ x%,y%
360 VDU 23,17,7,6,xzsimi);yzsimi)
370 GCOL c%(n%)
380 PRINT MIDS(as,n%,1);
390 x%+x4*xzsimi)
400 NEXT
410 WAIT
420 SYS 6,112,81%
430 SYS 6,112,81%
430 SYS 6,113,82%
440 CLS
450 SNAP s1%,82%
460 UNTIL FALSE
                                                                                                                                                                                                                                                                                           110 k%=32
120 k2%=k%/2
130 t1%=0
140 t2%=120
150 t3%=200
160 DIM spr t79000
170 spr10e2/8FFF
180 spr14=0
190 spr18=16
200 spr112=16
210 COLOUR 0,80,80,80
220 VDU 19,0,24,80,80,80
230 FROCS
240 ON ERROR SYS 6,112,81%:SYS "Hourgl ass_Smash":PRINTREPORT$" at line "STR$ER LON:END
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             369 AND #2
700 BNE FSI
710 IRRORAT
720 PLA
730 TAY
740 PLA
750 TAX
760 PLA
776 STASC
778 JAP (oldIRQ)
790 :
810 LDA &FEAE
820 AND #620
830 EBC IRRORAT
840 LDA #8
840 LDA #8
850 STA colcount
860 .DLI
870 STA COLCOUNT
890 LDA data+1, X
910 CMP #EFF
920 BNE PS+10
930 LDA data+2, X
910 CMP #ITIME
950 LDA data+2, X
970 AND MACA
950 LBR A
950 LBR A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       470 NEXT
480 ENDPROC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        490 :
500 DEF PROCline(x%,y%,x2%,y2%,i1,i2)
510 IF y2%=y% is=0 ELSE is=(i2-i1)/(y2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         510 IF y2%=y% is=0 F
%-y%)
520 ii=i1
530 dy%=ABS(x2%-x%)
540 dx%=y2%-y%
550 s1%=SGN(x2%-x%)
560 e%=-dx%
570 i%=1
580 REPEAT
590 p%(x%.0)=x%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       580 REPEAT

590 p%(k%,0)=x%

600 p%(k%,1)=y%

610 ii+=is

620 p%(k%,2)=ii

630 e%+=dy%<<1

640 k%+=1
                                                                                                                                                                                                                                                                                             ass_Smass_fram
L:ON:END
250 SYS "Hourglass_On"
260 FOR i%=1 TO 23
270 SYS "Hourglass_Percentage",i%*4.34
     Listing 5 - Dali
                     10 REM >Dali (Info5)
20 REM by Jan Vibe
30 REM for 32-bit machines
40 REM (c) BAU July 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     030 648 (%+=1)
650 REPEAT
650 REPEAT
570 IF e%=0 x%+=81%
670 IF e%=0 e%-=dx%<<1
680 UNTL le%-0
690 y%+=1
700 i%+=1
710 UNTL i%>dx%
720 ENDPROC
730 :
740 DEF PROCpalette
750 REPEAT
760 r%=RND(2)-1
770 g%=RND(2)-1
                                                                                                                                                                                                                                                                                                           280 s$=STR$i%
                                                                                                                                                                                                                                                                                                         280 ss=STM:1%
290 PROC6
300 PROCflip
310 t=20*SINRAD(7.5*i%+90)
320 PROCa(640,0,155,0,1)
330 SYS 46,256+16,8pr,s$,0,0,-0,1279,1
               40 kem (c) HAU July II

50 :

60 MODE 12

70 MODE 140

80 OFF

90 ORIGIN 640,512

100 81%=1

110 82%=2

120 M%=0

130 title$="Time Warp"

140 p%=360/LEN(title$)
                                                                                                                                                                                                                                                                                             330 SYS 46,250+10,591,00

223

340 NEXT

350 SYS "Hourglass_Off"

360 a%=43

370 REPEAT

380 a%=(a%+1) MOD 44

390 b%=ABS(22-a%)+1
```

```
1010 LSR A
1020 TAY
1030 LDA data+2,X
1040 AND #&F
1050 EOR #7
                                                                                                                                    1530 .c2loop
1540 STA &FE21
                                                                                                                                     1550 CLC
1560 ADC #&10
  1070 OPT EVAL ("FNcols"+STRScols (Mode))
1076 OPT EVAL("FN 1080: 1090 .Time 1100 LDA &FF48 1110 ADD &FF48 1110 ADD #GDF 1120 STA &FF48 1130 LDX colcount 1140 LDA data, X 1150 STA &FF48 1160 INX 1170 LDA data, X 1180 STA &FF49 1190 INX 1200 INX 1200 INX 1210 STX colcount
                                                                                                                                     1580 BPL c2100p
                                                                                                                                    1580 BPL c2loop
1590 ]
1600 =pass
1610:
1620 DEF FNcols4
1630 [OPT pass
1640 PHA
                                                                                                                                    1650 TYA
1660 AND #3
                                                                                                                                    1670 TAY
                                                                                                                                    1690 ORA col4base, Y
                                                                                                                                    1700 LDX #3
                                                                                                                                    1710 STA &FE21
1210 STX colcount
1220 LDA #&AØ
1230 STA &FE4D
                                                                                                                                    1730 ADC #610
1230 STA KFE4D
1240 STA KFE4E
1250 JMF IRQexit
1260 :
1270 .coldIRQ
1280 EQUW 0
1290 .colcount
1300 EQUB 0
1310 .col2base
1320 EQUB 0
1330 EQUB 80
1340 .col4base
                                                                                                                                    1750 CLC
1760 ADC #&30
1770 STA &FE21
1780 CLC
1790 ADC #&10
1800 STA &FE21
                                                                                                                                    1810 ]
1820 RETURN
                                                                                                                                    1840 DEF FNcols16
1340 .col4base
1350 EQUB 0
1360 EQUB &20
                                                                                                                                   1850 [OPT pass
1860 STA coll6base
1870 TYA
1880 ASL A
1890 ASL A
  1370 EOUB &80
                                                                                                                                   1880 ASL A
1990 ASL A
1910 ASL A
1910 ORA COll6base
1930 STA &FE21
1940 ]
1950 RETURN
1960 :
 1380 EQUB &AO
 1390 .col16base
  1400 EQUB 0
1410 J
1410 J
1420 =P%-addr
1440 DEF FNCols2
1450 [OPT pass
1460 PHA
1470 TYA
                                                                                                                                    1970 DEF PROCEDISOFF
                                                                                                                                   1980 ?&FE4E=&20
                                                                                                                                    199Ø ENDPROC
1490 TAY
                                                                                                                                   2010 DEF PROCEILISON
1510 ORA col2base, Y
```

```
2030 ENDPROC
```

#### Listing 9 – ABCDir

```
10 REM >ABCDir (Info9)
20 REM By Nick Craig-Wood
30 REM For 32 bit machines
40 REM (C) BAU July 1992
           60 DIM block% 256
           70 name%=block%+&14
      80 ?block=3
90 SYS "OS Word",14,block%
100 execaddr%=iblock%
110 loadaddr%=EFFFFFD00 OR (block%?4)
120 DIM dirs$(1000)
130 level%=0
140 INPUT "Start directory (default = ): ";dir$
150 IF dir$="" dir$=""e"
160 PROClook(dir$,0)
170 END
       180 :
190 DEF PROClook(dir$,start%)
200 LOCAL p%,level%
210 level%=start%
       230 REPEAT
230 REPEAT
240 SYS "05_GBPB",10,dir$,block$,1,p%,
240 TO ,, , ,p%
250 IF (p%=0) AND (block$!£10=2) THEN
260 name$-dir$*"."
270 a%=name%
280 WHILE ?a%<>0
290 name$+=CIR$?a%
300 a%+=1
310 ENDWHILE
320 dira$(level%)=name$
330 level%+=1
340 PROClock (name$,level%)
350 ENDH
       350 ENDIF
       370 IF level%>start% THEN
      390 FOR i%=start% TO level%-1
400 SYS "OS_File",2,dirs$(i%),loadaddr
      410 SYS "OS_File", 3, dirs$(i%),, execadd
      420 PRINT dirs$(i%)
```

```
440 ENDIF
450 ENDPROC
```

#### Listing 10 - Chaos

10 REM >Chaos By Matthew Godbolt and Richard Talbot-Watkins (C) BAU July 1992

(Info10)
20 MODE1:INPUTa,b,c:q=512:VDU29,640;q
:12:t=0:v=0:f=q:FOR1=0T099:s=t=5GNV\*ABS(
v\*b-c):t=a-v:k=ABS(s\*f)>q ORABS(t\*f)>q-fi f=f(1-k\*.2):v=s:HEXT:f=f/1.5:t=0:v=0:k=0
:REFEATS=t-SGNV\*ABS(v\*b-c):t=a-v:GCOL0,k
+1:FLOT69,s\*f,t\*f:v=s:k=(k+1)MOD3:UNTIL0

#### Listing 11 - Weed

10 REM >Weed By Matthew Godbolt and R chard Talbot-Watkins (C) BAU July 1992

20 MODE1: VDU23; 8202; 0; 0; 0; 19, 3, 6; 0; :D MODEL: VDUZ3; 8282; 9; 0; 0; 19, 3, 5; 0; 10 IMC 256: W=0 PCONN=070255 (CYN=0; NEXT: REPER TX=RND(256) -1: Y=C?X:A=C? (X-1AND255) :B=C? (X+1AND255) :A=(A AND(A>B))+(B AND(A>B)) :Y=Y=(Y-A)\*(A>Y)+1: CYX=Y: W=W+1: COOL0, (W DIV512) MOD3+1: PLOT69; 128+X\*4, Y\*4: UNTILY>

#### Listing 12 - MarsScape

10 REM >MarsScape By Peter Warden (C)
BAU July 1992 (Info12)
20 MODES:FORC=1TO16:COLOURC=1,C\*16,C\*
4,0:NEXT:OFF:DIMm(320,256):FORX=1TO320:F
ORy=1TO256:m(x,y)=((m(x,y-1)+m(x-1,y))/2)
+((RND(2000)-12000)/1000):GOLIm(x,y)+4:F
LOT 69,x\*4,y\*4:NEXT:NEXT

#### Listing 13 - GasPlanet

10 REM >GasPlanet By Peter Warden (C)
BAU July 1992 (Info13)
20 MODE12:FORC=0T015:COLOURC,c\*16,c\*8
0:MEXT:DIMm(256,360):FORX=1T0255:FORy=1  $\label{eq:total_continuous_cont$ 

#### C PROGRAMMING

#### Typing in the C application.

```
MakeDat - Creates !Timely application. - Basic Program
C listing 1 - Save as $.!Timely.c.Timely - Text file
C listing 2 - Save as $.!Timely.Make - Obey File
C listing 3 - Save as $.!Timely.MakeFile - Makefile
C listing 4 - Save as $.UserCLib.c.DrawUtils - Textfile
C listing 5 - Save as $.UserCLib.c.FontUtils - Textfile
C listing 6 - Save as $.UserCLib.c.Memory - Textfile
C listing 7 - Save as $.UserCLib.c.UserLib - Textfile
C listing 8 - Save as $.UserCLib.c.WimpUtils - Textfile
C listing 9 - Save as $.UserCLib.h.DrawUtils - Textfile
```

```
C listing 10 - Save as $.UserCLib.h.FontUtils - Textfile
C listing 11 - Save as $.UserClib.h.Macros - Textfile
C listing 12 - Save as $.UserCLib.h.Memory - Textfile
C listing 13 - Save as $.UserCLib.h.UserLib - Textfile
C listing 14 - Save as $.UserCLib.h.WimpUtils - Textfile
```

Because many of the lines are longer than 40 characters a RETURN is donated by a paragraph character (¶). When typing the listings into Edit or SrcEdit only press return when you encounter such a character. Do not type in the ¶ character. The full Timley application can be found on the monthly disc, in compiled and

#### Listing 1

```
10 REM >MakeDat (C1)
20 REM Create various !Timely files
30 REM for 32-bit machines
            40 REM by Dave Acton
50 REM (c) BAU July 1992
           70 free%=(HIMEM-END-&8000) AND &FFFFF
           80 DIM w% free%
80 DIM w% free%
90 REPRAT
100 READ file$
110 IF file$c>"" THEN
120 READ type%
130 PRINT"Creating file """file$"" (t
Ype &"; Type%;")"
140 IF type%;")"
140 IF type%sFFF OR type%=&FEB THEN
150 out*=OPENOTI(file$)
150 REPRAT
170 READ line$
180 IF line$c>"" BPUT#out%,line$
190 UNTIL line$="""
         200 CLOSE#out%
        220 READ olen%
       260 WHILE p%<olen%
270 b%=FNb
280 IF b%=130:p%; w%=FNb:p%+=1
290 IF b%=131 AND b%:=162 THEN
300 b%=b%=162
310 f%=p%+FNb
320 FOR i%=0 TO n%=1
330 ?(w%+p%+i%)=?(w%+f%+i%)
340 b%x-
350 p%+=n%
360 ENDIF
370 IF b%:130 OR b%>162 THEN p%?
p%+=1
       270 b%=FNb
```

IF b%<130 OR b%>162 THEN p%?w%=b%:

```
380 ENDWHILE
390 SYS "OS_File",0,file$,,,,%,,%+p%
400 ENDIF
410 SYS "OS_File",18,file$,type%
420 ENDIF
430 UNTIL file$="*"
440 FRINT'"All files created okay"
            450 END
 460:
470 DEF PMb
480 LOCAL b%,c1%,c2%,i%
490 IF d5="THEN
500 READ d5,c1%
510 c2%=0
520 FOR 1%=1 TO LEN(d5)/2
530 c2%+=EVAL("E"+MID$(d$,2*i%-1,2))
540 MEXT
550 IF c1%<>(c2% MOD 100) PRINT"Error
in DATA line ";d1%:END
560 d1%=1
570 ENDIF
580 b%=EVAL("E"+LEFT$(d5,2))
            580 b%=EVAL("&"+LEFT$(d$,2))
            59Ø d$=MID$(d$,3)
           600 =b%
610 DATA "!Boot",&FEB
620 DATA "IconSprites <Obey$Dir>.!Spri
      630 DATA "Iconspires Coeysbry, 15,12,26"
630 DATA "1Config", EFFF
650 DATA "96 40 3 1 -1"
660 DATA "95 40 3 1 -1"
660 DATA "4, %a, %b, %d, %y"
670 DATA "homerton. bold 10 11"
680 DATA "homerton. bold 10 11"
690 DATA "corpus. bold 10 10"
710 DATA "200 80 3 2 -1"
720 DATA "400 80 3 2 -1"
720 DATA "homerton. bold 3 10"
740 DATA "homerton. bold 3 10"
740 DATA "homerton. bold 3 10"
750 DATA "corpus. bold 14 14"
750 DATA "trinity. bold 18 18"
770 DATA "Siz 120 3 -1 -1"
780 DATA "Week starting %d %b %y,%a,Apointments,%d, Week&U"
pointments, %d, Week%U'
```

```
790 DATA "homerton.bold 12 14"
800 DATA "homerton.bold 9 16"
810 DATA "corpus.bold 12 12"
820 DATA "corpus.bold 11 11"
830 DATA "512 400 3 -1 -1"
830 DATA "512 400 3 -1 -1"
840 DATA "ha % d % % Y, Appointments, %
d%by"
850 DATA "homerton.bold 12 14"
860 DATA "homerton.bold 8 10"
870 DATA "homerton.bold 7 8"
880 DATA "corpus.medium 13 13"
890 DATA "corpus.medium 13 13"
990 DATA "Brithday"
910 DATA "Holiday"
910 DATA "Holiday"
920 DATA "Boldline"
930 DATA "Bedline"
930 DATA "Bedline"
930 DATA "Bedline"
930 DATA "85"
950 DATA "85"
950 DATA "87"
980 DATA "1"
100 DATA "1"
1000 DATA "1"
1010 DATA "1"
1020 DATA "ToonSprites <Timely$Dir.Sprites "
1040 DATA "1"
                   840 DATA "%a %d %b %Y,,Appointments,,%
 1030 DATA "IconSprites <Timely$Dir>.!Sprites"
1040 DATA "|"
1050 DATA "RMEnsure FPEmulator 2.80 RML
oad System:Modules.FPEmulator"
1060 DATA "RMEnsure FPEmulator 2.80 Err
or You need FPEmulator 2.80 or later"
1070 DATA "|"
1080 DATA "|"
1080 DATA "RMEnsure SharedCulbrary 3.75
RMLoad System:Modules.Culb"
        ARMLoad System: Modules.CLib"

1090 DATA "RMEnsure SharedCLibrary 3.75

Error You need SharedCLibrary 3.50 or 1
 ater"
1100 DATA "|"
1110 DATA "RMEnsure ColourTrans 0.52 RM
Load System:Modules.Colours"
1120 DATA "RMEnsure ColourTrans 0.52 Er
ror You need ColourTrans 0.52 or later"
1130 DATA "|"
```

un-compiled states.

```
1140 DATA "wimpslot -min 480k -max 480k

1150 DATA "|"
1160 DATA "Run <Timely$Dir>.!RunImage %

"0"
1170 DATA "187 ites", &FF9
1190 DATA 258
1200 DATA 010000001083045020000, 46
1210 DATA 010000001083045020000, 46
1210 DATA 010000001871084018328, 31
1220 DATA 160000001871084018328, 31
1230 DATA 01000000187107777777, 52
1240 DATA 001187088307000001107450, 52
1240 DATA 001187088307000001107450, 52
1240 DATA 00118708830700000110747777, 7
1260 DATA 00118708830700000110747777, 7
1260 DATA 00118708810810073853060, 97
1270 DATA 717783108B1180073853060, 97
1270 DATA 07484107B478710700003, 52
1270 DATA 07484107B478710700003, 52
1270 DATA 807484107B4787107000083, 52
1270 DATA 8070808080808108320004, 78
1300 DATA 80608080809780798530, 77
1340 DATA 80608080109720707FFF, 24
1350 DATA 7FFF8310466078009819A, 78
1360 DATA 31A253A275A297A289A2DB, 14
1370 DATA 92FFFF, 44
1370 DATA 92FFF, 54
1380 DATA "DIATY", &FFF
1390 DATA "Timely"
1400 DATA **
1410 
                                  1140 DATA "wimpslot -min 480k -max 480k
```

# PAGES

```
2750 DATA 4C6173740D874082928780, 55
2776 DATA 8440888041557889202483, 95
2770 DATA 8840888041557889202483, 95
2770 DATA 8846880290837085608380, 25
2780 DATA 34655C6574653880463817, 97
2780 DATA 34835782388037911810207, 95
2800 DATA 34835782388037911810207, 95
2800 DATA 3483582458312400631764083, 41
2810 DATA 2450837568381208848266, 38
2820 DATA 080287200D688980780720, 60
2830 DATA 080287200D688980780720, 60
2830 DATA 08038812053886014876044, 82
2850 DATA 086488185053886014876044, 82
2850 DATA 08648818053886014876044, 82
2850 DATA 08658818053886014876044, 82
2850 DATA 08688818053886014876044, 82
2850 DATA 08688818053886014876044, 82
2850 DATA 08688818053886014876044, 82
2850 DATA 08688818053886014876044, 82
2890 DATA 0861881220760836804, 75
2890 DATA 0883284608886078900, 04
2900 DATA 081806839267600538863, 75
2930 DATA 0885881886078391642818, 16
2940 DATA 08858818885080326789790, 38
2940 DATA 08858818885080326789790
2950 DATA 08180689267860068188, 16
2950 DATA 081806892678600681878, 16
2950 DATA 08180689267860786008, 60
2950 DATA 081806892606786008, 60
2950 DATA 0818068187604486600799, 12
2950 DATA 0818076818764486600799, 12
2950 DATA 08180768926007860009, 12
2950 DATA 0818076818764486600799, 12
2950 DATA 08180618764486600799, 12
2950 DATA 08068885000788000865, 12
2950 DATA 0806888500086000788000865, 12
2950 DATA 0806888500086000788000865, 12
2950 DATA 0806888500086000788000865, 12
2950 DATA 08068888500098000860007800
```

```
C Listing I

/* Title: >c.Timely¶
*%
*Purpose: Time manager¶
*%
*(c) PaU 1992¶
*%
*/g

#include "wimp.h"¶
#include "wimpt.h"¶
#include "wimpt.h"¶
#include "wimpt.h"¶
#include "wimpt.h"¶
#include "restartender
#include "restartender
#include "restartender
#include "restartender
#include "menu.h"¶
#include "menu.h"¶
#include "menu.h"¶
#include "dox.h"¶
#include "wert.h"¶
#include "wert.h"¶
#include "coords.h"¶
#include "coords.h"¶
#include "beb.h"¶
#include "beb.h"¶
#include "saveas.h"¶
#include "saveas.h"¶
#include "drawfobj.h"¶
#include "drawfobj.h"
#include
```

er\_where;¶ static enum {save\_as\_text ,save\_as\_draw

static enum (save\_as\_text, save\_as, save\_whole) save\_mode: I static time\_t ct[maxcol][maxrow]: I static memory\_block diary: I static dbox enter\_box; I static time\_t enter\_time; I static BOOL enter\_new; I

```
static enum {entf_tm=0 ,entf_ok,entf_cn
c,entf_ms,entf_lst,entf_nxt,entf_del,ent
f_set);

 typedef enum (never=-1 ,year,month,week
   day, hour | period; ¶
%
static struct (int cellw,cellh;%
period cellperiod,xperiod,yperiod;%
char name[40],xlab[16],ylab[16],clab[1
6],save[12];%
font_desc font[4];%
} style[4];%
Static struct (wimp_w hand; 
int ref; s
memory_block diag; s
char name[40], save[12]; s
time_t start; s
period type; s
int sizex, sizey; s
   viewer[timely_maxwindows+1];¶
  typedef struct {draw_textareastrhdrhdr;¶
 draw_textareastrend end; 
char string[1]; 
} draw_utils_text_area; 
}
 Typedef struct {int size; T
time_t when; T
int tag; T
char message[1]; T
        diary_entry; %
    typedef struct {int size;¶
   time_t when;¶
int tag;¶
        diary_entry_hdr;¶
   static void timely_close_viewer(int i) {

{ensure_memory(&viewer[i].diag ,0), {};

wimp_utils_close_window(viewer[i].ref)
      :¶
viewer[i].hand=0;¶
   static int timely_entry(int i) %
  (diary_entry *d; T
int j=0,off=0; T
BOOL found=FALSE; T
   HOUR FOUND: FOUND: Garden Found (d=(diary_entry*) (diary_anchor+off); for (d->size!=0 && j<i) (=-d->size; for found; foun
    j++;¶
)¶
else found=TRUE;¶
      PI
return((d->size==0 && i==j)?-1:off);¶
PI
    static void refresh_entry()¶
    (int i;¶
strftime(temp_string,256,style[day].na
   me,localtime(&enter_time)); A
dbox_setfield(enter_box,entf_tm,temp_s
  ror (i=0,i<8;i++) q
dbox_setnumeric(enter_box,entf_set+3*i
,i==enter_tag); q
)q</pre>
  Static void fill_in_entry() {
  (diary_entry *d; {\bar{1}} \)
  if (enter_new) (dbow_setfield(enter_box, entf_new); {\bar{2}} \)
  dbow_fadefield(enter_box, entf_nxt); {\bar{3}} \)
  dbow_fadefield(enter_box, entf_nxt); {\bar{3}} \)
  win_settlie(dbow_syshandle(enter_box); {\bar{3}} \)
  is entry"); {\bar{3}}
  static void open_entry()¶
(fill_in_entry();¶
dbox_showstatic(enter_box);¶
       refresh entry();¶
      static void skip_entry(int skip)f
(if (timely_entry(enter_where+skip)!=-1)
    (enter_where+skip; f
fill_in_entry(); f
refresh_entry(); f
]
]
]
      % static void timely_update_viewers()% {void timely_new(period,time_t,BOOL);% int i;% for (!=p.ictimely_maxwindows;i++) {if (viewer[i].handl=0)% timely_new(viewer[i].type,viewer[i].st art,FALSE);%
```

```
%
static void delete_current_entry(BOOL
update)
{
    (int offset=timely_entry(enter_where);
    diary_entry *d;
    if (offset!=-1) (d=(diary_entry*)
    (diary_anchor+offset)
 memory midextend(&diary.offset,-(d->si
 ze));¶
if (update) timely_update_viewers();¶
33
34
35
static int timely_steps(period type,ti
me_t start)3
{double steps;1
struct tm 't=localtime(&start);1
switch(type) (case year:1
1->tm year+;1
 1->tm_year++; T
steps=difftime(mktime(1),start)/(60*60
 break; I
 case month: ¶
 1->tm_mon++;¶
steps=difftime(mktime(1),start)/(60*60
steps=diffi
*24);I
break;I
case week:I
steps=7;I
break;I
case day:I
steps=1;I
break;I
 break; %
  return((int) steps);¶
  static void timely_next(period type, st
  ruct tm *1)¶
{if (type==day) 1->tm_hour++;¶
  else 1->tm_mday++;¶
  static void timely_get_xyc(int *x,int *y,draw_coltyp *c,struct tm *1,period ty
 "y, raw_coltyp" c, struct
peon a
{int temp; n
time_t t=mktime(1); n
switch(type) {case year: n
*x=1->tm_mon; n
  1->tm_mday=1;9
  mktime(1);9
  case week:¶
  *y=1->tm_wday;¶
*c=white;¶
 *c=white;¶
break;¶
case day:¶
*x=0;¶
*y=1->tm_hour;¶
*c=white;¶
break;¶
default:¶
break;¶
   P(
   static int timely x(double x,period ty
   (return((int)(lbord+style(type).cellw*x
   P; ( (
  static int timely_y(double y,period ty
pe)%
(return((int)(-tbord-style[type].cellh*
))%
   static void check_diag(draw_diag *diag
   )4
(draw_error dr_err;¶
if (!draw_verify_diag(diag,&dr_err))¶
werr(0,"Bad diagram");¶
 static void timely_main_redraw(int i,w
imp_redrawstr *r,BOOL *morel3
(draw_error dr_err;1
while (*more) (visdelay_begin();7
if (!draw_render_diag(!draw_diag*) &vi
ewer[i].diag, (draw_redrawstr*) r,1,&dr_e
rr))3
werr(1,"couldn't render");9
visdelay_end();7
wimpt_noerr(wimp_get_rectangle(r,more));7
}1
}3
    static void timely_redraw_window(int i
    (bool more; T
  wimp_redrawstr r; T
r.w=viewer[i].hand; M
```

wimpt\_noerr(wimp\_redraw\_wind(&r,&more) imely\_main\_redraw(i,&r,&more);T % static BOOL tml\_saveproc(char \*filenam e,void \*handle)% (bool ok,done=PALEE;% os\_filestr file;% FILE \*f;% int i=(int) handle;% diary entry \*f;% dlary\_entry \*d;%
struct tm \*1;%
struct tm \*1;%
if (strlen(filename) > timely\_max\_name
\_len) (werr(0 ,"Filename is too long");%
return(FALSE);% switch (save\_mode) (case save\_as\_draw:¶
file.loadaddr=draw\_file\_type;¶
file.start=(int)viewer[i].diag.anchor;¶
file.end=file.start+viewer[i].diag.use dig file.action=0x0a;¶ file.name=filename;¶ ok=(wimpt\_complain(os\_file(&file))==0) case save\_whole:¶
f=fopen(filename,"w");¶
if (f==0)¶ else (fprintf(f ,"%s\n", creator); ¶ 1=0;%
do (d=(diary\_entry\*) (diary.anchor+i);%
if (d->size==0)% ir (a->size==0)% done=TRUE;¶ else {l=localtime(&d->when) ;¶ strftime(temp\_string,256,"%d %b %y",1) ; I fprintf(f, "%d %d %d %d (%s)\n%s\n\n",1 ->tm\_year,1->tm\_mon,1->tm\_mday,d->tag,te mp\_string,d->message); I i+=d->size; I while (!done);¶ fclose(f);¶ ok=TRUE;¶ break:9 default:9 break: ¶ return(ok);¶ x static void timely\_click(wimp\_mousestr \*inf,int i)q (void timely\_new(period,time\_t,BOOL);q int mx,my,clickx,clicky,steps,cell,x,y ,c,offset;¶ struct tm \*1;¶ BOOL found=PALSE, done=FALSE; q period pr.type=viewer[i].type; q wimp\_wstate r; q diary\_entry \*d; q if ((inf->bbits & (wimp\_BLEFT | wimp\_B RIGHT))!=0) (wimp\_get\_wind\_state(inf->w ,&r); q mx=coords\_x\_toworkarea(inf->x, (coords\_ cvtstr\*) &r.o.box)-lbord-draw\_bord; q my=viewer[i].sizey-coords\_y\_toworkarea (inf->y, (coords\_cvtstr\*) &r.o.box)-tbord +draw\_bord; q clickx=mx/style[type].cellw; q clickx=mx/style[type].cellw; q clicky=my/style[type].cellh; q steps=timely\_steps(type, viewer[i].star t); q BOOL found=FALSE.done=FALSE:9 t);¶
=localtime(£viewer[i].start);¶
for (cell=0;cell<steps && ifound;cell+
+) (timely\_get\_xyc(&x ,&y,&c,1,type);¶
if (x==clickx && y==clicky && mx>=0 &&
my>=0) (pr=style(type).cellperiod;¶
found=TRUE;¶ Tound=TRUE; ¶

if (x==clickx && my<0 && !found)
{pr=style[type].xperiod ; ¶
found=TRUE; ¶ if (mx<0 && y==clicky && !found)
{pr=style[type].yperiod ;q
found=TRUE;¶</pre> ) I if (found) (if (viewer[i].type==day) (enter\_time=mktime(1) ; I if ((inf->bbits & wimp\_BLEFT)!=0) ente r\_new=TRUE;¶
else (enter\_where=0 ;¶ (diary.anchor+offset)
;
if (d->size==0) done=TRUE;
else (if (d->when==enter\_time)
done=TRUE;
else (set+=d->size ;
enter\_where++;
f enter\_new=(d->size==0); I open\_entry();¶ else (if ((inf->bbits & wimp\_BRIGHT)!=0) ctm
ely\_close\_viewer(i);¶
timely\_new(pr,mktime(1),TRUE);¶

timely\_next(type,1);% %
static void timely\_add\_appointment(tim
e\_t t,char \*m,int k,BOOL update)
(diary\_entry \*d;%
int i=0,req=(sizeof(diary\_entry\_hdr)+s
trlen(m)+4) & ('3);%
BOOL found\*FALSE;% do (d=(diary\_entry\*) (diary\_anchor+i);¶
if (d->size==0)¶ if (a->812e==v,1
found=TRUE;1
else (found=(difftime(t ,d->when)<=0);1</pre> }%
) while (!found);%
memory\_midextend(&diary,i,req);%
d=(diary\_entry\*) (diary.anchor+i);%
d->size=req;% d->when=t;¶ d->tag=k;¶ strcpy(d->message,m); ¶ stropy(d->message,m;);d diary.used+=req;f if (update) timely\_update\_viewers();f static BOOL enter\_event\_handler(dbox d void 'ev,void 'handle) { (wimp\_eventstr 'e=(wimp\_eventstr') ev;q dbox\_field field;q handle=handle;q switch (e->e) {case wimp\_ECLOSE:q dbox\_hide(d);q return(TRUE);q case wimp\_EBUT:q fielde=>data.but.m.i;q switch (field) (case entf\_ok:q dbox\_getfield(d,entf\_ms,temp\_string,25 6);q 6);I dbox\_hide(d);I if (!enter\_new) delete\_current\_entry(F ALSE);¶
timely\_add\_appointment(enter\_time, temp\_string, enter\_tag, TRUE);¶
break;¶
case entf\_cnc:¶
dbox\_hide(d);¶
break;¶
case entf\_lst:¶
skip\_entry(-1);¶ skip\_entry(-1);¶ break; T case entf\_nxt: T skip\_entry(1); T break; ¶ break;q
case entf\_del;q
dox\_hide(d);q
delete\_current\_entry(TRUE);q
break;q
default:q
if(field>=entf\_set) (enter\_tag=(field=entf\_set)/3;q
refresh\_entry();q
)q return (TRUE) ; ¶ return(FALSE);¶ static void timely\_clear()¶
(ensure\_memory(&diary ,4);¶
((diary\_entry\*) diary.anchor)->size=0;¶
diary.used=4;¶ %
static void timely\_main\_load(int filet
ype,char \*filename)%
(int id[9],k;%
BOOL load\_ok=PALSE;%
FILE \*f;% (strlen(filename)>timely\_max\_name\_1 ir (strien(filename)>timely\_max\_name\_1
en)
werr(FALSS, "File name is too long");
else (if (filetype=text\_file\_type)
(strepy(temp\_atring\_filename);
f=fopen(filename, "r");
if (fi=0) (fscanf(f
,"%s\n",temp\_string);
if (stremp(temp\_string);
if (stremp(temp\_string,creator)==0)
(timely\_clear();
visdelay\_begin();
while ([fscof(f)) (fscanf(f ,"%d %d %d %d %[\n]\n",kld[5]
,kld[4],kld[3],&k,temp\_string);
fscanf(f,"%[\n]\n\n",temp\_string);
fscanf(f,"%[\n]\n\n",temp\_string);
ld[0]=0;
ld[0]=0;
ld[1]=0;
f timely\_add\_appointment(mktime((struct tm\*) ld), temp\_string, k, FALSE);9 )% visdelay\_end();% timely\_update\_viewers();% fclose(f);¶ 

static void timely\_loadproc()¶
(char \*filename;¶

int filetype=xferrecv\_checkinsert(&fil timely\_main\_load(filetype, filename); ¶ g
static void viewer\_event\_handler(wimp\_eventstr \*e,void \*handle)
{
(int i=(int) handle)
{
switch (e-ve) (case wimp\_EREDRAW;
}
timely\_redraw\_window(i);
}
case wimp\_EOPEN:
{
wimp\_utils\_open\_window(&e->data.o);
}
case wimp\_ECLOSE:
}
timely\_close\_viewer(i);
}
break;
}
case wimp\_EBUT:
} case wimp\_EBUT:¶
timely\_click(&e->data.but.m,i);¶
break;¶ break;¶
case wimp\_ESEND:¶
case wimp\_ESENDMANTACK:¶
switch(e->data.msg.hdr.action) (case
wimp\_MBNTALOAD:¶
case wimp\_MDNTAOPEN:¶
timely\_loadproc();¶
break;¶
default:¶
break;¶
);¶ default:¶ break; % static menu tml\_menumaker(void \*handle (int i=(int) handle; % (int i=(int) handle;%
menu ml.m2;%
if (fevent is\_menu\_being\_recreated())
(strcpy(temp\_string ,">Whole diary,");%
strcat(temp\_string, viewer[i].mane);%
ml=menu\_new("Save", temp\_string);%
ml=menu\_new(viewer[i].save,">Save as Drawfile,">Save, ">Save as text");%
tnl\_cmenu=menu\_new(viewer[i].save,">Save,">Save,">Save,">Save," menu\_submenu(m1,2,m2);¶
menu\_submenu(tml\_cmenu,1,m1);¶ return(tml cmenu): T case 2:9 save\_mode=save\_as\_draw;¶
saveas(draw\_file\_type,viewer[i].save,v
iewer[i].diag.used,tml\_saveproc,0,0,(voi
d\*) i);¶ break; % Static BOOL valid\_cell(int x,int y) {

(if (x<0 || x>=maxcol || y<0 || y>=maxr
ow) return (FALSE); {

return(ct[x][y]!=(time\_t)-1); {

} T
void wimp\_utils\_forceredraw(int i) {
(wimp\_wstate wst; {\frac{1}{2}}
if (winfo[i].is\_open)
(wimp\_gst\_wind\_state(winfo[i].hand ,&wst ); {\frac{2}{2}}
wimp\_close\_wind(winfo[i].hand); {\frac{2}{2}}
wimp\_open\_wind(&wst.o); {\frac{2}{2}}
} {\frac{2}{2}} static void timely insert detail(char \*ent,int \*cx,int \*cy,int ex0,int ey0,int ex1,int ey1,draw\_coltyp fore,draw\_coltyp back,int fh,period type,memory\_block \* m1 (int splitchar=' ';1 (ont splitchar=' ';1 (ont string entry\_string;1 char tempe;2 (arw.object dummy;1 while (\*cy>=ey0 && ent(0)>' ') (entry\_string.sent ;5 entry\_string.sent;1 entry\_st (entry\_string.term>0) (splitchar=' '/%
tempo=ent[entry\_string.term];%
ent[entry\_string.term]=0;%
ent[entry\_string.term]=0;%
add\_text\_box(ent,draw\_screenToDraw(\*cx),draw\_screenToDraw(\*cx),draw\_screenToDraw(\*cy),draw\_screenToDraw(\*cy+fh),draw\_just\_draw\_bjust\_destyle[type].font[3],fore,back,&dummy,m);%

if (entry\_string.split>0 && ent[entry\_string.term]>0) (\*cy-=fh ;% \*cx=ex0;% ) I else \*cx+=mpts\_to\_screen(entry\_string. ent[entry\_string.term]=tempc;¶ ent=&ent[entry\_string.term];¶ while (ent[0]==' ') ent++;¶ else (if (\*cx>ex0) (\*cy-=fh ;¶ \*cx=ex0;¶ else splitchar=-1:4 Static void timely\_new(period type,tim e\_t start,BOOL tofront) { (char temp[256], { int new=0,steps,cell,i,x,y,pass,ex0,ey 0,ex1,ey1,ex,cy;{ int row0=1NT\_MAX,row1=1NT\_MIN,col0=INT\_MAX,coll=INT\_MIN,f daw\_coll+INT\_MIN,f draw\_coltyp colour; T draw\_box bx; T draw\_object dummy; g
wimp\_wind \*window; g
BOOL exists=FALSE\_found; g
diary\_entry d; g
font\_info entry\_font; g
wimp\_readpalette(Epal); g
if (type==never || type==hour) return; g
will entertimely\_maxwindows && lexist
s) (if (viewer[new].hand!=0 &&
viewer[new]
.type==type && viewer[new].start==start)
exists=TRUE; g
elbe new+; g struct tm \*1;¶ else new++:¶ )¶ if (!exists) (window=template\_syshandle("timely") ;¶ new=0;¶ new=0;q while (new-timely\_maxwindows && viewer [new].hand!=0) new++;q if (new==timely\_maxwindows) {werr(0, "Too many viewers");q return;q ]q ]q for (x=0;x<maxco1;x++)¶
for (y=0;y<maxrow;y++)¶
for (y=0;y<maxrow;y++)¶
for (y=0;y<maxrow;y++)¶
ct(x|x|y|=(time\_t)-1;¶
strftime(viewer[new].name,40,style[typ
e].name,localtime(&start));¶
strftime(viewer[new].aave,12,style[typ
e].save,localtime(&start);¶
ensure\_memory(&viewer[new].diag,1024);¶
font\_readinfo(style[type].font[3].hand
le,&entry\_font);¶
for (pass=0;pass2;pass++) (if (pass=1)
(draw\_create\_diag(draw\_diag\*) &viewer[
new].diag,creator,bx);¶
for (x=0;x<4;x++)¶
add\_font\_to\_list(&style[type].font[x])
;¶ add\_draw\_object(&viewer(new].diag,&dum my,draw\_FirstObject,TRUE);% steps=timely\_steps(type,start);¶ l=localtime(&start);¶ l=localtime(&start);7
i=0;7
for (cell=0;cell<steps;cell++)
(timely\_get\_xyc(kx\_,&y,&colour,l,type);7
ct[x][y]=mktime(l);7
rowl=min(row0,y);7
rowl=max(row1,y);7
coll=max(coll,x);7
coll=max(coll,x);7
for [pass=1] (found=false;7
ex=1) (found=false;7
found=false;7
found=false;7
if (style(type).olab[0]>='') (font\_setfont(style(type).font[2].handle);7 ex0+=48; /\* calculate this! \*/¶ )# exl=timely\_x((double) x+1, type);# ey0=timely\_y((double) y+1, type);# ey1=timely\_y(y, type);# ex=ex0;# cy=ey1-(entry\_font.maxy-entry\_font.min y);# font.setfont(style[type].font[3].handl e);# /#
d=(diary\_entry\*) (diary.anchor+i);
if (type==day && cx>ex0) (cy=entry\_font.maxy-entry\_font.miny;
# )4
timely\_insert\_detail("\* ",&cx,&cy,ex0,
ey0,ex1,ey1,\*pp,colour,entry\_font.maxy-e
ntry\_font.miny,type,&viewer(new).diag);4
if (type=aday) | type=aweek)4
timely\_insert\_detail(d->message,&cx,&c
y,ex0,ey0,ex1,ey1,black,colour,entry\_fon
t.maxy-entry\_font.miny,type,&viewer(new).diag);4
.diag);4



```
"i+=((diary_entry*) (diary.anchor+i))->
       else found=TRUE;¶
       else i+=d->size;¶
 }
}
while (!found);
if (atyle[type].clab[0]>=' ')
(strftime(temp ,32,style[type].clab,1);
add_text_box(temp_draw_screenToDraw(timely_x(x,type)),draw_screenToDraw(timely_x(x,type)),draw_screenToDraw(timely_x(double) y+0.25,type)),draw_screenToDraw(timely_x((double) x+1,type)),draw_louter_draw_tjust_,dstyle[type].font[2],black,colour_sdummy_sviewer[new].diag]);
}
       timely_next(type,1);¶
       viewer [new] . sizex=lbord+rbord+style [ty
   viewer[new].sizex=lbord+rbord+style[ty
pe].cella*(col1-col0+l);¶
viewer[new].sizey=tbord+bbord+style[ty
pe].cella*(row1-row0+l);¶
bx.x9=0;¶
bx.y1=0;¶
bx.y1=0;¶
bx.y1=0;¶
bx.y1=0;R
izey];¶
bx.x1=draw_screenToDraw(viewer[new].sizex);¶
bx.x1=draw_screenToDraw(viewer[new].sizex);¶
     zex);¶
       begin_path_obj(0x42,0x10,0x20,black);¶
     for (y=0;y<maxrow;y++) (x=0;%
while (x<=maxcol) (while (x<=maxcol &&
!valid_cell(x,y) &
& !valid_cell(x,y-1)) x++;%
    & !valid_celi(x,y-i) x++y
if (x<=maxcol)
(add_move_to_path_obj(timely_x(x ,type),
timely_y(y,type));
while (valid_cell(x,y) || valid_cell(x
,y-i) x++y
add_line_to_path_obj(timely_x(x,type),
timely_y(y,type));
}</pre>
     for (x=0;x<maxcol;x++) (y=0;¶
while (y<=maxrow) (while (y<=maxrow &&
!valid_cell(x,y) &
& !valid_cell(x-1,y)) y++;¶
    i valid_cel(x-1,y) y++y
if (y<=maxrow)
(add_move_to_path_obj(timely_x(x ,type),
timely_y(y,type))?
while (valid_cel1(x,y) || valid_cel1(x
-1,y)) y++f
add_line_to_path_obj(timely_x(x,type),
timely_y(y,type));}</pre>
    and_path_obj();%
and_draw_object(&viewer[new].diag,&dum
my,draw_LastObject.TRUE);%
for (y=row0;y=row1;y+) (x=col0;%
while (ct(x)[y]=e(time_t)-1) x++;%
strftime(temp,32,style(type].ylab,loca
ltime(&ct(x)[y]);%
add_text_box(temp_0,draw_screenToDraw(-64-style(type].cellh*(y+1)),draw_screen
ToDraw(lbord*7/8),draw_screenToDraw(-64-style(type].cellh*y),draw_riust_draw_mid
dle,&style(type].font[1],black,white,&du
mmy,&viewer[new].diag);%
}%
       )T
for (x=col);x=col1;x++) (y=row0;T
while (ct[x][y]==(time_t)-1) y++;T
strftime(temp,32,style[type],xlab,loca
ltime(act[x][y]));T
add_text_box(temp,draw_screenToDraw(lb
ord-style[type],cellw*[x],draw_screenToDraw(lbords-
tyle[type],cellw*(x+1),0,draw_centre,dr
aw_bjust_style[type],font(0),black,whit
e,&dummy,&wiewer[new].diag);T
}T
         )%
draw_shift_diag((draw_diag*) &viewer[n
ew].diag,draw_screenToDraw(draw_bord),dr
aw_screenToDraw(draw_bord+viewer[new].si
          zey));¶
check_diag((draw_diag*) &viewer[new].d
          iag);¶
         iag); {\( \) if (lexists) \( \) window->titleflags=window->titleflags | wing_INDIRECT; {\( \) \) window->title. indirecttext. buffer=view er(new). name; {\( \) \( \) window->title. indirecttext. validstring \( \) window->title. indirecttext. validstring
           =0;¶
window->title.indirecttext.bufflen=20;¶
        window->vitle.indirecttext.bufflen=20;3
window->ex.v0=draw_bord;¶
window->ex.yledraw_bord+tbord+bbord+st
yle[type].cellh'(rowl-row0+1);¶
window->ex.v1=draw_bord+lbord+rbord+st
yle[type].cellw'(coll-coll+1);¶
window->ex.y0=draw_bord;¶
window->box=window->ex;¶
window->sex=0;¶
window->sex=0;¶
window->gy=0;g
           window-secy=0;¶
viewer[new].ref=wimp_utils_create_wind
ow("Timely".new.TRUE);¶
viewer[new].hand=winfo[viewer[new].ref
           ].hand;¶
viewer[new].type=type;¶
win register_event handler(viewer[new])
.hand,viewer_event handler,(void*)new);¶
event_attachmenumaker(viewer[new]).hand
.tml_menumaker,tml_menu_proc,(void*)new)
```

```
if (tofront) \( \)
wimp_utils_front(viewer[new].ref,in_ce
ntre,0,0); \( \)
     wimp_utils_forceredraw(viewer[new].ref
  %
static time_t year_start(time_t t)%
(struct tm *1;%
l=localtime(st);%
l=>tm_sec=0;%
l=>tm_min=0;%
l=>tm_hour=0;%
l=>tm_hour=0;%
l=>tm_mon=0;%
l==tm_mon=0;%
l==tm_mon=0;
       return(mktime(1));¶
       static void timely_iconclick(wimp_i ic
       timely_new(year, year_start(time(&t)), T
       RUE) : ¶
       static void timely_info_about_program(
     static void timely_into_about_program(
void)%
(dbox d;%
if (d=dbox_new("ProgInfo"), dl=NULL)
(dbox_setfield(d ,timely_info_field,time
ly_version_string);%
dbox_show(d);%
dbox_show(d);%
       dbox_dispose(&d); ¶
  Static void tml_qmenu_proc(void *handl
e,char *hit)¶
(handle=handle ;¶
switch (hit(0)) {case tml_qmenu_info:¶
timely_info_about_program();¶
break;¶
case tml_qmenu_quit:¶
exit(0);¶
       Static void timely_init()%

(file *in;%
int i,j;%
double a,b;%
for (i=0;ictimely_maxwindows;i++)
(init_memory_block(&viewer[i],diag,0x10
0,TRUE);%
viewer[i].hand=0;%
)%
       13
14
for (i=0;i<8;i++) {fscanf(in
,"%s\n",temp_string);1
dbox_setfeld(enter_box,entf_set+2+3*i
,temp_string);1</pre>
            }1
fclose(in);1
init_memory_block(&diary,256,FALSE);1
  init_memory_block(&diary,256,FALSE);%
tinely_clear();%

static BOOL timely_initialise(void)%
(wimpt_init("timely");%
res_init("%Imely");%
res_init("%Imely");%
flex_init();%
flex_init();%
drawinit();%
drawfoid_init();%
drawfoid_init();%
drawfoid_init();%
drawfoid_init();%
drawfoid_init();%
draw_utile_init();%
draw_utile_init();%
enter_box=dow_new("mner");%
dbox_raw_eventhandler(enter_box_enter_event_handler,(void*) id_enter);%
timely_init();%
f( timl_qmenu=menu_new("Timely",">Info
,Quit"),tml_qmenu=NULD;%
return(FALSE);%
baricon("itimely",(int)resspr_area(),timely_incon(ick);%
in_egister_event_handler(win_ICONBAR,tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qmenu_tml_qm
                  timely_clear();¶
                    If
int main(int argc,char *argv[]) {
if (timely_initialise())
(timely_main_load(text_file_type ,"<Time
lySDir.Diary"); {
while (TRUE) {
    respect research(); {
    respect respectively.
                    event_process(); T
```

```
return(0);9
 C Listing 2
 set makedir <obey$dir>¶
set userclib &.UserCLib¶
amu -f<makedir>.makefile¶
 C Listing 3
 # > MakeFile¶
 CC = ccM
CFLAGS =-c -1$.Risc_OSLib -1$.UserCLibM
  cmakedir>.!RunImage: <makedir>.o.Timel
bs¶
# squeeze <makedir>.!RunImage¶
count <makedir>.!RunImage¶
 cmakedir>.o.Timely: <makedir>.c.Timely%
$(CC) $(CFLAGS) <makedir>.c.Timely -o
<makedir>.o.Timely%
   cuserclib .. o. UserLib: <userclib .. c. Use
 rLid%
$(CC) $(CFLAGS) <userclib>.c.UserLib -
o <userclib>.o.UserLib%
  <userclib>.o.Memory: <userclib>.c.Memo
  ry¶
$(CC) $(CFLAGS) <userclib>.c.Memory -o
<userclib>.o.Memory¶
   cuserclib>.o.FontUtils: <userclib>.c.F
 ontUtils¶
$(CC) $(CFLAGS) <userclib>.c.FontUtils
-o <userclib>.o.FontUtils¶
   vuserclib>.o.DrawUtils: <userclib>.c.D
 $(CC) $(CFLAGS) <userclib>.c.DrawUtils
-o <userclib>.o.DrawUtils¶
   cuserclib .. o. WimpUtils: <userclib .. c. W
  timpUtils: {dsetclib>c.wimputils: {dsetclib>c.wimputils]
$(CC) $(CFLAGS) <userclib>.c.wimputils]
-o <userclib>.o.wimputils]
  C Listing 4
  /* Title: >c.drawutils¶
     Purpose: Misc drawfile utils¶
      (C) Copyright D C Acton 19929
   *¶
*/¶
  Include "memory.h"3
#include "fontutils.h"3
#include "font.h"3
#include "font.h"3
#include "drawfobj.h"3
#include "drawfobj.h"3
#include "werr.h"3
#include "werr.h"3
#include (stdib.b)3
#include (stdib.b)3
#include (stdib.b)3
#include (stdib.h)3
#include (stdib.h)3
#include (stdib.h)3
#include (stdib.h)3
#include (stdib.h)3
#include (limits.h)3
  ##define draw_utils_extend 1024%
##define black 0x00000003
##define white 0xffffff003
##define darkgrey 0x50500008
##define lightgrey 0xdddddd003
##define transp - 1%
##define draw_utils_leeway draw_screenT
ODTaw(4)%
    memory_block draw_utils_obj; %
    int draw_utils_fontno;¶
    m
typedef enum {draw_ljust ,draw_centre,d
   raw_rjust) draw hjustify; A
typedef enum (draw_bjust ,draw_middle,d
raw_tjust) draw_vjustify; A
    typedef struct {draw_fontref fontref; { } char fontname{1}; { }
       fontlist_entry; ¶
    typedef struct (draw_pathstrhdr hdr;%)
int data[64];%
) path_obj;%
   x
void draw_utils_init() {
    (draw_registermemoryfunctions(flex_allo
    c,flex_extend,flex_free); {
}
```

```
init memory block(&draw_utils_obj,0x10
 0. TRUE) : 9
 19
Y
void add_draw_object(memory_block *m,d
raw_object *o,draw_object where,BOOL ver
ify)
draw_error dr_err;
draw_objectType s;
int objsize;
char *c=draw_utils_obj.anchor+draw_uti
ls_obj.used;
draw_utils_obj.used & 3) !=0)
(draw_utils_obj.used++;
f(c++)=0;
f(
     P:0=(++)
    ensure_extra_memory(m,draw_utils_obj.u
 ensure_extra_memory(m,draw_utils_obj.u
sed);1
s.bytep=draw_utils_obj.anchor;1
((draw_pathstr*) draw_utils_obj.anchor
)-size=draw_utils_obj.used;1
if ((draw_oreateobject((draw_diag*) m, s,where,TRUE,o,sdr_err))1
werr(0,"couldn't create object");1
if (verify) (if
((draw_oreateobject((draw_diag*) m, *o,sobjsize,sdr_err))1
werr(0,"Bad object");1
}1
 Yavoid draw_utils_begin_font_list() {\( \) (draw_fontliststr *fl; {\( \) } \) (draw_fontliststr *fl; {\( \) } \) ensure_memory(&draw_utils_obj, sizeof(d raw_fontliststrhdr)) {\( \) draw_utils_obj.used=sizeof(draw_fontliststrhdr); {\( \) fl=(draw_fontliststr') draw_utils_obj.anchor; {\( \) fl->tag=draw_oBJFONTLIST; {\( \) draw_utils_fontno=1; {\( \) } \) }
       void add_font_to_list(font_desc *f) \( \)
     {font list_entry *e; ¶
int l=strlen(f->name)+1+sizeof(draw_fo
       ensure extra memory(&draw utils obj,1)
    :1
e=(fontlist_entry*) (draw_utils_obj.an
chor+draw_utils_obj.used);1
e>fontref=draw_utils_fontno;1
f>-no=draw_utils_fontno;1
strcpy(e>fontname,f->name);1
draw_utils_obj.used+1;1
draw_utils_fontno++;3
1
       void begin_path_obj(unsigned char join
       capwind,¶
unsigned char tricapwid,unsigned char
       tricaphei, T
    tricaphei, % draw_coltyp fillcol) % (path_obj *d;% ensure_memory(&draw_utils_obj, 256);% draw_utils_obj.used=sizeof(draw_pathst_bday).
    draw_utils_obj.used=sizeof(draw_pathst
rhdr);3
d=(path_obj*) draw_utils_obj.anchor;3
d->hdr.tag=draw_OBJPATH;3
d->hdr.size-0;/* no. of words of data
(will become size) */3
d->hdr.fillcolour=fillcol;3
d->hdr.pathwidth=0;3
d->hdr.pathwidth=0;4
d->hdr.pathwidth=0;4
       d->hdr.pathstyle.joincapwind=joincapwi
        nd;¶
       d->hdr.pathstyle.reserved8=0;¶
     d->hdr.pathstyle.tricapwid=tricapwid;

d->hdr.pathstyle.tricapwid=tricapwid;

d->hdr.pathstyle.tricaphei=tricaphei;

d->hdr.bbox.x0=INT_MAX;

d->hdr.bbox.x1=INT_MIN;

d->hdr.bbox.y0=INT_MAX;

d->hdr.bbox.y1=INT_MIN;

d->hdr.bbox.y1=INT_MIN;

d->hdr.bbox.y1=INT_MIN;
        void add_obj(int x,int y,draw_path_tag
type t)%
{path_obj *d;%
     int p;¶
ensure_extra_memory(&draw_utils_obj,3*
sizeof(int));¶
draw_utils_obj.used+=3*sizeof(int);¶
d=(path_obj*) draw_utils_obj.anchor;¶
p=d->hdr.size;¶
x=draw_screenToDraw(x);¶
d->data[p++]=t;¶
d->data[p++]=t;¶
d->data[p++]=y;¶
d->data[p++]=y;¶
d->data[p++]=y;¶
d->hdr.size=p;¶
]¶
           void add_move_to_path_obj(int x,int y) {
{add_obj(x ,y,draw_PathMOVE); {
           void add_line_to_path_obj(int x,int y)¶
{add_obj(x ,y,draw_PathLINE);¶
          q
void end_path_obj()¶
{path_obj *d;¶
int p;¶
ensure_extra_memory(£draw_utils_obj,2*
sizeof(int));¶
de(path_obj*) draw_utils_obj.anchor;¶
draw_utils_obj.used+=2*sizeof(int);¶
pad->hdr.size;¶
deletal_edraw_pathCLOSE;¶
          d->data[p++]=draw_PathCLOSE;¶
```

d->data[p++]=draw_PathTERM; %
Pf.
T
<pre>void add_text_box(char *text,int x0,in</pre>
t y0,int x1,int y1,¶
draw_hjustify hjust,draw_vjustify vjus
t,¶
font_desc *f,draw_coltyp textcol,draw_
coltyp backcol, ¶
draw_object *o,memory_block *m)¶
{draw_textstr *d; ¶ font_info fi; ¶
ensure_memory(&draw_utils_obj,256);¶
d=(draw_textstr*) draw_utils_obj.ancho
r:¶
if (text==0)¶
d->text[0]=0;¶
else¶
strcpy(d->text,text);¶
font_setfont(f->handle); %
font_stringbbox(d->text,&fi);¶
fi.minx=mpts_to_draw(fi.minx); %
fi.maxx=mpts_to_draw(fi.maxx); %
fi.miny=mpts_to_draw(fi.miny); %
fi.maxy=mpts_to_draw(fi.maxy); %
d->tag=draw_OBJTEXT;¶
d->textcolour=textcol;¶
d->background=backcol;¶
d->textstyle.fontref=f->no;¶
d->textstyle.reserved8=0;%
d->textstyle.reserved16=0;¶
<pre>d-&gt;fsizex=(int) pts_to_draw(f-&gt;xpt); {\fill d-&gt;fsizey=(int) pts_to_draw(f-&gt;ypt); {\fill T</pre>
d->fsizey=(int) pts_to_draw(f->ypt); T
switch (vjust) {case draw_bjust: 1
d->coord.y=y0-fi.minx;¶
break;¶
case draw_middle:¶
d->coord.y=(y0+y1-fi.maxy)>>1;¶
break;¶
case draw_tjust:¶
d->coord.y=y1-fi.maxy;% break;%
N N N N N N N N N N N N N N N N N N N
switch (hjust) (case draw_ljust:¶
d->coord.x=x0-fi.minx;%
break;¶
case draw_centre:¶
d->coord.x=(x0+x1-fi.maxx)>>1;¶
break;¶
case draw_rjust:¶
d->coord.x=x1-fi.maxx;¶
break;¶
Pf
d->bbox.x0=d->coord.x+fi.minx-draw_uti
ls_leeway;¶
d->bbox.x1=d->coord.x+fi.maxx+draw_uti
ls_leeway;¶
d->bbox.y0=d->coord.y+fi.miny-draw_uti
ls_leeway;¶
d->bbox.yl=d->coord.y+fi.maxy+draw_uti
ls_leeway;¶
draw_utils_obj.used=(int)(d->text)+str
len(d->text)-(int)d+1;¶
add_draw_object(m,o,draw_LastObject,FA
LSE);¶
19
C Listing 5

```
/* Title: >c.fontutils¶
                Purpose: Misc font utils T
                  (C) Copyright D C Acton 1992%
      *¶
*/¶
% sinclude "flex.h"¶
#include "werr.h"¶
#include "werr.h"¶
#include "font.hst.h"¶
#include "fontlist.h"¶
#include "menu.h"¶
#include "menu.h"¶
#include "wimp.h"¶
#include "wimp.h"¶
#include "wisdelay.h"¶
#include "userlib.h"¶
#include "stdib.h¦
#include <a href="stdib.h"¶
#include <a href="stdib.h"¶
#include <a href="stdib.h¦
#include
      typedef struct (char name[48]; ¶
      font handle; ¶
draw_fontref no; ¶
    int id;%
double xpt,ypt;%
char user_size[8];%
char user_height[8];%
} font_desc;%
    flex_ptr font_utile_names=0;%
char font_utils_prefix[256]="",font_ut
ils_work[256];%
int font_utils_fontsizes[5]=[8,10,12,1
4,20);%
fontlist_node *font_root=0;%
        void font_utils_verifyfont(font_desc *
    d)%
{int i=1,was=0,match_level=0;%
char pref[256],temp[256],*p=*font_util
s_names,*tail;%
    strcpy(pref,d->name);¶
  tail=stroh(pref,'.');

while (*p!=0 && match_level<5) (if

(userlib_stromp(pref,p))%

match_level=5;%

if (tail=0) (if (match_level<4)

(sprintf(temp ,"Trinity%s",tail);%
```

```
if (userlib_strcmp(temp,p))% match_level=4;%
match_level=4;¶
)%
if (match_level<3) {sprintf(temp,
,**%*",tail);¶
if (userlib_strcmp(temp,p))%
match_level=3;¶
)%
if (indech_level<2) (if
(userlib_strcmp("rinity*",p))%
match_level=2;¶
)%</pre>
   match_level=1;¶
if (match_level !=was) {strcpy(d->name
    was=match level:¶
   p+=strlen(p)+1; T
i++; T
   if match_level==0)$
werr(1,"Can't initialise fonts");$
if (match_level<5) {sprintf(temp,"Can't find font ""%s" -
using %s instead",pref,d->name);$
werr(0,temp);$

   font_find(d->name,(int)d->xpt*16,(int)
d->ypt*16,0,0,&d->handle);¶
      void font utils declarefont (font desc
   void font_utils_declarefont(font_de
'd,char 'name,float xpt,float ypt)%
(strcpy(d->name, name);%
d->xpt=xpt;%
d->xpt=xpt;%
font_utils_verifyfont(d);%
log_utils_verifyfont(d);%
    void font_utils_redeclarefont(font_des
               *d)¶
      {font _lose(d->handle); {font_utils_verifyfont(d); {font_utils_verifyf
   char *font_utils_add_font_to_menu(char *fname,char *d,int id,int pass,char sep
   % char *font_utils_makelist(fontlist_nod e *n,char *d,char *current,int id,BOOL r eg,int pass,char sep)%
       (int was=strlen(current); %
 {int was=strlen(current); g
if (reg) g
d=font_utils_add_font_to_menu("(Regula
r)",d,id,pass,sep); g
while (n!=0) (current[was]='.'; g
strcpy(&current[was+1],n->name); g
if (n->flag) g
d=font_utils_add_font_to_menu(&current
[1],d,id,pass,sep); g
d=font_utils_makelist(n->son,d,current
,id,FALSE,pass,sep); g
current[was=10; g
n=n->brother; g
}g
      return(d); A
       void font_utils_refresh() {
{int need; {}
void cont_utils_refresh()%
(int need)%
videlay_begin();%
if (font_root !=0)%
fontlist_free_font_tree(font_root);%
font_root=fontlist_list_all_fonts(FALS_E);%
if (font_utils_names!=0)%
flex_free(font_utils_names);%
font_utils_work[0]=0;%
need=(int)(2*font_utils_makelist(font_root,0;font_utils_work,0;FALSE;1,0));%
walign(need);%
flex_alloc(font_utils_names,need);%
*font_utils_makelist(font_root,*font_utils_names,font_utils_work,0,FALSE;2,0)=
**;%
      visdelay end(); ¶
   %

woid font_utils_uptodate()%

{char temp[256];%
os_read_var_val("Pont$Prefix",temp,256
};%

if (temp[0]==0)%
werr(1,"Cannot locate any fonts");%
if (strcmp(temp,font_utils_prefix)!=0)
{strcmp(font_utils_prefix,temp);%
font_utils_refresh();%
}

font_utils_refresh();%
      %
doind font_utils_init()%
{/* init_memory_block(&font_utils_names
,ox10,TRUE); */%
font_utils_refresh(); */%
font_utils_represh(); */%
      Pf
       menu font utils sizemenu(char *title,c
    har *buffer,float userval)¶
(char sub[64],*p=sub;¶
```

```
int i;¶
menu sizemenu;¶
for (i=0;i<5;i++)¶
p+=sprintf(p,"%d,",font_utils_fontsize
s(i]);¶
s(i));A
slzemenu=menu_new(title,sub);A
menu_make_writeable(sizemenu,6,buffer,
6,"a0-9.");A
return(sizemenu);A
]A
 Menu font_utils_menu(char *maintitle,f
ont_desc *f)¶ (menu,fmenu,cmenu;¶
(menu fmenu,smenu,hmenu,cmenu;¶
char main[256],sub[256],*p;¶
fontlist_node *n;¶
int i;¶
font utils_uptodate();¶
font utils_uptodate();¶
font size,Font height");¶
smenu=font_utils_mizemenu("Font size",
f->user_size,f->xpt);¶
hmenu=font_utils_mizemenu("Font height
",f->user_height,f->ypt);¶
p=main;¶
n=font_root;¶
while (n!=0) (p+=sprintf(p ,",%s",n->name);¶
  int i; I
  n=n->brother; ¶
 fmenu=menu_new("Font name",&main[1]);
n=font_root;

1=1; \( \text{M} \)
while (n!=0) {font _utils_work[0]=0; \( \text{M} \)
p=font_utils_makelist(n-son, sub, font_utils_work, f->id, n->flag, 2, ', '); \( \text{M} \)
were \( (p-1)=0; \text{M} \)
menu_submenu (fmenu, i, menu_new(n-vu)
menu_submenu(fi
sub));¶
i++;¶
n=n->brother;¶
)¶
  menu_submenu(cmenu, 1, fmenu); ¶
  menu_submenu(cmenu,2,smenu); 
menu_submenu(cmenu,3,hmenu); 
%
  return(cmenu);¶
  void font utils subcount (fontlist node
 "n, int *c) %
(while (n!=0) {if (n->flag) %
(*c)++; %
font_utils_subcount(n->son, c); %
SOOL font_utils_altersize(char *hit,fo
nt_desc *f,int options)%
{bool changed;%
char *user=(options==1)?f->user_size:f->user_height;%
double new_size,was=(options==1)?f->xp
tif->ypt;%
if (hit[1]>0) (if (hit[1]==6)%
new_size=strtod(user,0);%
else%
else%
 f->xpt=new size; ¶
  return(changed); ¶
 M

BOOL font_utils_menu_select(char *hit,

font_desc *f)N

(bool changed=FALSE;N

int new_id,i;N

char *p;N

fontlist_node *n=font_root;N

switch (hit[0]) (case 1:N

if (hit[1]>0 && hit[2]>0) (new_id=hit[2]);N
  while (i<hit[1]) (if (n->flag)¶
  new_id++; T
font_utils_subcount(n->son, &new_id); T
  n=n->brother:¶
  i++;¶
 1++;%
)%
changed (p=*font_utils_names ;%
if (changed) (p=*font_utils_names ;%
if (new_idol) (for (i=1;knew_id;i++)%
p+=strlen(p)+1;%
  }¶
strcpy(f->name,p);¶
  case 2:¶
case 3:¶
changed=font_utils_altersize(hit,f,hit
  [0]-1);¶
  default: 1
  break;¶
```

```
void font_utils_ticksubmenu(int p,int *c,int id)%
{wimp_menuitem *mi;%
int sub,was;%
p+s1zeof(wimp_menuhdr);%
do {was*c;%
mis(wimp_menuitem*) p;%
sub=(int) mi->submenu;%
if (sub!=-1)%
font_utils_ticksubmenu(sub,c,id);%
else%
(*c)++;%
if (*c>=id && id>was)%
mi->flags=mi->flags | wimp_MTICK;%
else%
  else¶
mi->flags=mi->flags & (~wimp_MTICK);¶
 p+=sizeof(wimp_menuitem); T
) while ((mi->flags & wimp_MLAST)==0); T
 void font_utils_ticksizemenu(int p,fon
t_desc *f,float cur) ¶
 t_desc *f, float cur) %
(int i, %)
wimp_menuitem *mi; %
p+=sizeof(wimp_menuhdr); %
for (i=0;i<5;i++) (mi=(wimp_menuitem*)
p; %
if (cur==font_utils_fontsizes[i]) %</pre>
 if (cur==font_utils_fontsizes[i]) 
mi->flags=mi->flags | wimp_MTICK; 
I
 mi->flags=mi->flags & (~wimp_MTICK); T
p+=sizeof(wimp_menuitem); T
} }
 g
void font_utils_tickmenu(menu m,font_d
esc *f)%
(int count=0;%
int p=(int)menu_syshandle(m)+sizeof(wi
mp_menuhdr);%
wimp_menuitem *mi=(wimp_menuitem*) p;%
font_utils_ticksubmenu((int)mi->submen
u,&count,f->id);%
mi=(wimp_menuitem*)(p+sizeof(wimp_menu
i+mm);%
 item)); T
font_utils_ticksizemenu((int)mi->subme
nu,f,f->xpt); T
 mi=(wimp_menuitem*)(p+2*sizeof(wimp_menuitem));
  font utils ticksizemenu((int)mi->subme
 ront_utils_ttestsemenu(|inc|mi=>subme
nu,f,f=>ypt):f
sprintf(f->user_size,"%-5.2f",f->xpt);f
sprintf(f->user_height,"%-5.2f",f->ypt
);f
);f
  C Listing 6
 /* Title: >c.memory¶
*¶
     Purpose: memory allocation librarys
      (C) Copyright D C Acton 1992¶
  */q
 #include "flex.h"A
#include "werr.h"A
#include "macros.h"A
#include <stdlib.h>A
#include <string.h>A
 %
typedef struct {char *anchor;%
int used;%
int extend;%
int size;%
BOOL flex;%
  ) memory_block; ¶
 %
void init_memory_block(memory_block *b
,int extend_units,BOOL flex)%
(b->anchor=0 ;%
b->used=0;%
b->size=0;%
b->extend=max(extend_units,4);%
b-flex=flex;%

1%
  void ensure_memory(memory_block *b,int
  size)¶
{div_t d=div(size+b->extend-1,b->extend
   size=d.quot*b->extend:9
  if (b->anchor==0) (if (size>0) (bool
       (b->flex)
 if (b->flex)
(ok=(flex_alloc((flex_ptr)&b->anchor ,si
ze)!=0)?
]
[Size (b->anchor=malloc(size) ;%
ok=(b->anchor!=0);%
]
  ) I if (lok) {werr(1 ,"Out of memory"); I } I
  )%
else (if (size!=b->size) (if (size==0)
(if (b->flex)%
flex_free((flex_ptr)&b->anchor);%
  free(b->anchor); ¶
   else (bool ok; ¶
  if (b->flex)
  (ok=(flex_extend((flex_ptr)&b->anchor ,s
ize)!=0); ¶
  else (b->anchor=realloc(b->anchor, size); ¶
```



```
if (winfo[i].del_when_closed)
{wimp_delete_wind(winfo[i].hand) ;%
winfo[i].hand=-1;%
                                                                                                                                                                                                                                                    #define save_dontquit 'N'9 #define save_thenquit 'Q'9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #include "macros.h"¶
ok=(b->anchor!=0);¶
 ) I if (lok) {werr(1 ,"Can't extend - out of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hdefine draw_utils_extend 1024%
Hdefine black 0x0000000%
Hdefine white 0xffffff00%
Hdefine darkgrey 0x50505000%
                                                                                                                                                                                                                                                       #define max windows 649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Windows-:¶
memory")
;
{
}
{
}
f
}

b->size=size;
{
}
{
}
{
}
}

T
}

T
}
                                                                                                                                                                                                                                                      M
#define open_xstep 320M
#define open_ystep 460M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          %
void wimp_utils_front(int i,open_where
where,int par1,int par2)%
(wimp_wstate wst;%
wimp_redrawstr check;%
wimp_get_wind_state(winfo[i].hand,&wst
).eg_get_wind_state(winfo[i].hand,&wst
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #define transp -19
                                                                                                                                                                                                                                                      typedef enum {in_centre ,in_space} open _where; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   extern memory_block draw_utils_obj; ¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  n
typedef enum (draw_ljust ,draw_centre,d
raw_rjust) draw_hjustify;¶
typedef enum (draw_bjust ,draw_middle,d
raw_tjust) draw_yjustify;¶
                                                                                                                                                                                                                                                        typedef struct {wimp_w hand; }
 Wooid ensure_extra_memory(memory_block
*b.int extra)%
{if (b->used+extra>b->size)%
                                                                                                                                                                                                                                                       wimp_w pane; ¶
int panex, paney; ¶
int id; ¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             );¶
if (!winfo[i].is_open) {bool
found=FALSE,giveup=FALSE;¶
                                                                                                                                                                                                                                                       Hool is_open; T
BOOL has_pane; T
BOOL del_when_closed; T
} window_info; T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rounderALSE,giveup=rALSE;i
int j.x,yiquvar(bbc_XWindLimit)<<bbc
_vduvar(bbc_XEigFactor);q
int sh=bbc_vduvar(bbc_YWindLimit)<<bbc
_vduvar(bbc_YEigFactor);q</pre>
    ensure memory(b,b->used+extra);9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  %
typedef struct {draw_fontref fontref; {}
char fontname {1}; {}
} fontlist_entry; {}
} If

wold memory_midextend(memory_block *b,
    int offset,int extra) I
{if (extra<0) (memmove(b->anchor+offset,b->anchor+off set-extra,b->used-(offset-extra)); I
    ensure_memory(b,b->used+extra); I
                                                                                                                                                                                                                                                       window info winfo[max_windows+1]; T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int real width=wst.o.box.x1-wst.o.box.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  typedef struct (draw_pathstrhdr hdr; % int data[64]; %
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          x0;X
int real_height=wst.o.box.y1-wst.o.box
                                                                                                                                                                                                                                                      %

void wimp_utils_set_icon_text(wimp_w h
and,wimp_i i,char *txt)%

(wimp_icon icon_inf;%
wimp_get_icon_info(hand,i,&icon_inf);%
strcpy(icon_inf.data.indirecttext.buff
er,txt);%
wimp_set_icon_state(hand,i,0,0);%
)%

%

**Control of the control of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   } path_obj; %
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int real_height=wat.o.box.yl-wat.o.bo
.y0;%
int width=min(real_width,aw-128);%
int height=min(real_height,sh-200);%
wat.o.xewst.o.box.x0;%
wat.o.yewst.o.box.yl;%
switch (where) (case in_centre:%
found=FALSE;%
break;%
case in_space:%
xsh:%
 ensure_memory(b,b-vased-octer,);

else (ensure_extra_memory(b ,extra);
memmove(b->anchor+offset+extra,b->anch
or+offset,b->used-offset);

T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Twoid draw_utils_init(void); Twoid add_draw_object(memory_block *m,d raw_object *o,draw_object where,800L verify); Twoid dad_font_to_list(font_desc *f); Twoid add_font_to_list(font_desc *f); Twoid begin_path_obj(unsigned char join capwind, Twoid was the same than the same that the same than the same than the same than the same than the 
    void free_memory_block(memory_block *b
                                                                                                                                                                                                                                                    void wimp_utils_select_icon(wimp_w han d,wimp_i i,BOOL select)% [wimp_icon icon_dat;%] wimp_iconflags flags;% wimp_get_icon_info(hand,i,&icon_dat);% flags=(select)?wimp_ISELECTED:0;% if ((icon_dat.flags & wimp_ISELECTED)) = flags)% wimp_set_icon_state(hand,i,wimp_ISELECTED);% ]%

% S
    {ensure_memory(b ,0);¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         case in space;
x=0;3
y=0+44;3
while(ifound && !giveup) (found=true ;3
for(=0;3\windows;++j) (if
(winfo[j].is.open)
(check.w=winfo[j].hand ;3
wimp_getwindowsultine(&check);3
wat.o.box.x0=x;3
wat.o.box.x1=x+width;3
wat.o.box.y1=y+width;3
wat.o.box.y1=y+gi;3
if (coords_boxesoverlap(&check.box,&wst.o.box)]
found=FALSE;4
}3

19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P;0=x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tricaphei, ¶
  C Listing 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  draw_coltyp fillcol);¶
void add_obj(int x,int y,draw_path_tag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  type t); 1 void add_move_to_path_obj(int x,int y)
  /* Title: >c.userlibq
           Purpose: Misc routines¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       roid add_line_to_path_obj(int x,int y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void end_path_obj(void); {\frac{1}{2}}
void end_path_obj(void); {\frac{1}{2}}
void add_text_box(char *text,int x0,in
t y0,int x1,int y1, {\frac{1}{2}}
draw_hjustify hjust,draw_vjustify vjus
t {\frac{1}{2}}

             (C) Copyright D C Acton 1992%
  *¶
*/¶
 ¶
#include "macros.h"¶
#include <stdlib.h>¶
#include <string.h>¶
                                                                                                                                                                                                                                                       N

void wimp_utils_select_icon_from_group
(wimp_w hand,wimp_i i0,wimp_i i1,wimp_i
j) (wimp_i k:%

for(k=i0;k<=i1;k++)%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                t.¶
font_desc *f,draw_coltyp textcol,draw_coltyp backcol,¶
draw_object *o,memory_block *m);¶
#endif¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             )¶
if (!found) (y-=par2 >> 2;¶
if (y<16+par2) (y=sh-44 ;¶
x+=par1 >> 2;¶
 int userlib_lc(char a,BOOL any)% {return((a>='a' && a<='Z' && any)?a+'a' -'\lambda';% }
                                                                                                                                                                                                                                                        wimp_utils_select_icon(hand,k,k==j);9
                                                                                                                                                                                                                                                      If
int wimp_utils_windowno(wimp_w handle)I(int i=0:I)
while (winfo(i).handl=handle && i<max_windows)I(i==max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_windows)I(i=max_w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             giveup=(x>sw-parl);¶
  191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Listing 10
int userlib_genstrcmp(char *s1,char *s 2,BoOL any)% {char cleuserlib_lc(*s1,any),c2=userlib_lc(*s2,any);% if (cl=0 && c2=0)% return(TRUB);% if (c2=0)% return(TRUB);% if (cl=c2 || cl=-'#')% return(userlib_genstrcmp(&s1[1],&s2[1],any));% }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             )A
default:A
break;A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /* Title: >h.fontutils¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Purpose: Misc font utils¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *I (C) Copyright D C Acton 1992¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ) I if (!found) {wst.o.box.x0=(sw-width)>>1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *¶
*/¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;A
wst.o.box.x1=wst.o.box.x0+width;A
wst.o.box.y0=180+((sh-180-height)>>1);A
wst.o.box.y1=wst.o.box.y0+height;A
                                                                                                                                                                                                                                                        void wimp utils attach pane (int w1, int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #ifndef __fontutils #
#define __fontutils #
                                                                                                                                                                                                                                                        w2,int xoff,int yoff) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \( \) \(
 return(userilo_genstrcmp(&sl[1],any));#

if (cl=='*') [bool ok=FALSE;#

char *s3=&s2[1];#

while (lok && *s3!=0) (ok=ok ||

userlib_genstrcmp(&sl[1],s3,a

ny);#

s3++;#
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #include "font.h"
#include "fontlist.h"
#include "fontlist.h"
#include "drawftypes.h"
#include "menu.h"
#include "macros.h"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             wst.o.behind=-1;¶
wimp_utils_open_window(&wst.o);¶
                                                                                                                                                                                                                                                        winfo[wl].paney=yoff;9
                                                                                                                                                                                                                                                       winfo[w1].paney=yoff; 7]

7

void wimp_utils_remove_pane(wimp_w han dle) 7

{winfo|wimp_utils_windowno(handle)|.has
pane=FALSE; 7

7

7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1
typedef struct (char name[48]; 1
font handle; 1
draw.fontref no; 2
int id; 2
double xpt,ypt; 1
char user_size(8); 1
} font_desc; 1
} font_desc; 1

    )¶
return(ok);¶
    return (FALSE); ¶
                                                                                                                                                                                                                                                        void wimp utils set ext(int i,int widt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (window==0 || windows==max_windows) T
                                                                                                                                                                                                                                                       h, int height) ¶ {wimp_redrawstr data; ¶ data.w=winfo[i].hand; ¶
  int userlib_strcmp(char *s1,char *s2)% {return(userlib_genstrcmp(s1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             return(-1);¶
created=(wimpt_complain(wimp_create_wi
nd(window,&handle))==0);¶
if (!created)¶
  ,s2,TRUE));¶
                                                                                                                                                                                                                                                       data.box.x0=0;3
data.box.x0=-height;1
data.box.x1=width;1
data.box.y1=0;1
wimp_set_extent(&data);1
)1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     extern memory block font_utils_fontnam
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return(-1);¶
while (winfo[new].hand!=-1) {new++ ;¶
  C Listing 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             while (wintoinew).nand:=-1) (new:)1

winfo[new].hand=handle; T

winfo[new].is_open=FALSE; T

winfo[new].has_pane=FALSE; T

winfo[new].id=id; T

winfo[new].del_when_closed=dwc; T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     extern fontlist node *font root; ¶
  /* Title: >c.wimputilsq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                void font_utils_listfonts(fontlist_nod e 'n,int 'i,char 'eurrent);%
void font_utils_refresh(void);%
void font_utils_refresh(void);%
void font_utils_uptodate(void);%
void font_utils_uptodate(void);%
void font_utils_declarefont(font_desc 'd,char 'name,float xpt,float ypt);%
menu font_utils_menu(char 'maintitle,f ont_desc 'f);%
BOOI font_utils_menu_select(char 'hit,font_desc 'f);%
void font_utils_tickmenu(menu m,font_d esc 'f);%
                                                                                                                                                                                                                                                      ya g void wimp_utils_open_window(wimp_opens tr *o) {
    {int i=wimp_utils_windowno(o->w); {
        if (winfo[i].has_pane) {int width,height; {
            wimp_wpinfo[winfo[i].pane].hand; {
            wimp_openstr p=*o; {
            wimp_openstr p=*o; {
            wimp_wstate(pn, spst); {
            wimp_state(pn, spst); {
            widthspst.o.box.xl-pst.o.box.y0; {
            heightspst.o.box.yl-pst.o.box.y0; {
            p.wspn; {
            p.box.x0=o->box.x0+winfo[i].panex-width-2; {
            p.box.x1=p.box.x0+width; {
            }
            viden.box.x1=p.box.x0+width; {
            }
            viden.box.x0+width; {
            viden.box.x0+width; {
            }
            viden.box.x0+width; {
            }
            viden.box.x0+width; {
            }
            viden.box.x0+width; {
            }
            viden.box.x0+width; {
            viden.box.x0+width; {
            }
            viden.box.x0+width;
              Purpose: general wimp utils T
              (C) Copyright D C Acton 19929
    *¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              windows++; A
return(new); A
  % include "wimp.h"% include "wimpt.h"% include "win.h"% include "wer.h"% include "werr.h"% include "werr.h"% include "bbc.h"% include "bbc.h"% include "coords.h"% include (stdifh.h)% include (string.h)% include "macros.h"% %
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
void wimp_utils_init()¶
{int i;¶
for (1=0;i<max_windows;++i)¶
winfo[i].hand=-1;¶
windows=0;¶</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      esc *f);¶
#endif¶
                                                                                                                                                                                                                                                       h-2;3
p.box.xl=p.box.x0+width;3
p.box.yl=o->box.yl+winfo[i].paney;3
p.box.y0=p.box.yl-height;3
p.x=pst.o.x;3
p.y=pst.o.y;3
winp_utils_open_window(&p);3
o->behind=pn;3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int wimp_utils_winfree() ff {return(max_windows-windows); ff } f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C Listing 11
    #define crs_left
#define crs_right
#define crs_down
#define crs_up
#define crs_shleft
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /* Title: >h.macros¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C Listing 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Purpose: General macros¶
                                                                                                                                                                                                                                                       /* Title: >h.drawutils¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (C) Copyright D C Acton 1992¶
                                                                                                             0x19c9
    #define crs_shieft 0x19c3
#define crs_shight 0x19c3
#define crs_shown 0x19e3
#define crs_cterion 0x19f3
#define crs_cterion 0x1ac3
#define crs_ctright 0x1ac3
#define crs_ctright 0x1ac3
#define crs_ctright 0x1ac3
#define crs_ctright 0x1ac3
#define del_left 0x07f3
#define del_left 0x07f3
#define del_left 0x1ac3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Purpose: Misc drawfile utils¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (C) Copyright D C Acton 1992¶
                                                                                                                                                                                                                                                           void wimp_utils_close_window(int i)9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P*
*/¶
                                                                                                                                                                                                                                                           {if (winfo[i].has_pane)¶
wimp_utils_close_window(winfo[i].pane)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ¶
#ifndef __drawutils¶
#define __drawutils¶
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T
#ifndef BOOLT
#define BOOL intT
#define TRUE 1T
#define FALSE OT
                                                                                                                                                                                                                                                           wimpt_noerr(wimp_close_wind(winfo[i].h
```

#include "fontutils.h" %

0x18b9

and)); T winfo[i].is\_open=FALSE; T

#define del\_right

#endifq

%
#define walign(a) a=(a+3)&(~3)%
#define min(a,b) ((a-b)?a:b)%
#define max(a,b) ((a-b)?a:b)%
#define pts\_to\_draw(i) (i)\*640%
#define draw\_to\_pts(i) (i)\*640%
#define mpts\_to\_draw(i) (i)\*640%
#define mpts\_to\_draw(i) (i)\*00/64%
#define mpts\_to\_screen(i) (i)\*400%
#define mpts\_to\_screen(i) (i)\*400%
#define screen\_to\_mpts(i) (i)\*400%
%

#### Listing 12

#### Listing 13

/\* Title: >h.userlib%
\*%
\*Purpose: Misc routines%
\*%
\*(c) Copyright D C Acton 1992%
\*%
\*/%
\*/%
\*/%
int userlib\_lc(char a,BOOL any);%
int userlib\_genstrcmp(char \*sl,char \*s
2,BOOL any);%
int userlib\_strcmp(char \*sl,char \*s2);%
%

#### Listing 14

/\* Title: >h.wimputils¶
\*¶
\* Purpose: general wimp utils¶
\*q

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BOOL has\_pane; {\( \)
BOOL del\_when\_closed; {\( \) \} \) window\_info; {\( \) \}

extern window\_info; {\( \) \}
extern window\_info winfo[max\_windows]; {\( \) \}
extern int windows, wins\_defined; {\( \) \}

void wimp\_utils\_set\_icon\_text(wimp\_w hand, wimp\_i i, hold retx); {\( \) \}
void wimp\_utils\_select\_icon(wimp\_w hand, wimp\_i i, hold select); {\( \) \}
void wimp\_utils\_select\_icon\_from\_group (wimp\_w hand, wimp\_i i0, wimp\_i i1, wimp\_i i); {\( \) \}
int wimp\_utils\_windowno(wimp\_w handle); {\( \) \}
void wimp\_utils\_remove\_pane(wimp\_w handle); {\( \) \}
void wimp\_utils\_remove\_pane(wimp\_w handle); {\( \) \}
void wimp\_utils\_set\_ext(int i,int widt h,int height); {\( \) \}
void wimp\_utils\_close\_window(wimp\_opens tr \*0); {\( \) \}
void wimp\_utils\_close\_window(int i); {\( \) \}
void wimp\_utils\_croate\_window(char \*name, int id, BOOL dwo); {\( \) \}
void wimp\_utils\_croate\_window(char \*name, int id, BOOL dwo); {\( \) \}
void wimp\_utils\_winfree(void); {\( \) \}
\*\( \) \*
\*\*Bendiffs\*

#### **Arm Programming**

# Listing 2 10 REM >ARM2 20 REM By Dave Lawrence 30 REM FOr 32 bit machines 40 REM (C) BAU Unly 1992 50 : 60 DIM code 100 70 link=14 80 pc=15 96 FOR pass=0 TO 2 STEP 2 100 P%=code 110 [OPT pass 120 .fortest

| 130 | MOV | R1,#1 |
| 140 .loop |
150	SHI	256+ASC"\*"
160	ADD	R1,R1,#1
170	CMP	R1,#11
180	BNE	loop
190		
200	MOV	pc,link
210	JNEXT	
220	PRINT "Press SPACE to print stars!	
"";		
230	IFGET	
240	CALL	fortest
Listing 3		

10 REM >ARM3
20 REM By Dave Lawrence
30 REM For 32 bit machines
40 REM (C) BAU July 1992
50 :
60 DIM code 100
70 link=14
80 pc=15
90 FOR pass=0 TO 2 STEP 2
100 P%=code
110 [OPT pass
120 .fordemo
130 MOV R1,#1
140 .loop1 MOV R2,#1
150 .loop2 SWI 256+ASC"\*"

160 ADD R2,R2,#1
170 CMF R2,R1
180 BLE 10op2
190 SWI "OS,NewLine"
200 ADD R1,R1,#1
210 CMF R1,#5
220 BLE 10op1
230
240 MOV pc,link
250 INEXT
270 IFGET
280 PRINT "Press SPACE to run demo ";
270 IFGET
280 PRINT
290 CALL fordemo

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# HELPING HAND

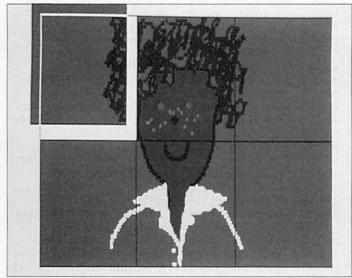
Chris Drage looks at some of the software on offer for those with special educational needs

hildren with special educational needs are now able to communicate and have access to information that was previously beyond their capabilities. This is thanks to a variety of different input devices which we looked at in detail in BAU April 92. This time we will be taking a look at some of the software packages that have appeared during the past year and are relevant to special needs education.

It is not surprising that many authorities are purchasing Northwest SEMERC's Phase 2 for their schools, as it provides a versatile, introductory word processor for key stages 1 and 2 and secondary special educational needs. It has easily created graphics screens, variable sized text and the ability to pop pictures into the text area. The wide choice of text colours, screen colours and print sizes makes it is suitable for children with moderate learning difficulties and the visually impaired.

Children enjoy being able to pick up a coloured sprite (from a Clip Art 1 disc) drop it onto a page of writing and watch the flow writing around Similarly, borders Borders 1 & 2 discs) add interest to a page, resulting in attractively framed Theme discs such as the Hungry Caterpillar and Christmas disc, that contain picture writing screens, templates and artwork, are also available.

One of the best communication aids to appear last year



Earlybirds - delightfully easy to use

was My World, a framework program that allows children to pick up graphic objects and place them on a prepared background or diagram. The objects can be pictures or labels of any size, colour and font. Once you have worked through the 18 or so example screens you can see how the program can be used for a manner of cross curricular activities. My World screens are created in Draw. Loaded sprites, saved as objects, can be used equally well.

The design of the software ensures that aspects like screen size will always be constant. You can opt for the program to take over the whole screen or to work in a window. All work can be saved and printed out. A Simple stuff sampler disc contains an additional 17 screens to run in My World

and includes everything from constructing and disassembling a skeleton to making a simple electrical circuit. My World is a versatile program for almost all levels. Look out for the French version La Monde a Moi!

#### LITERACY AIDS

Brilliant Computing centres most of its software around introducing computer and prereading activities to children. Most of its software provides options that allow you to choose from a variety of input including devices most switches and the new Touchwindow. The popular Blob 1 & 2 and Count with Blob. First Steps, Switch On and Touchgames successfully persuade children with disabilities to interact with the computer.

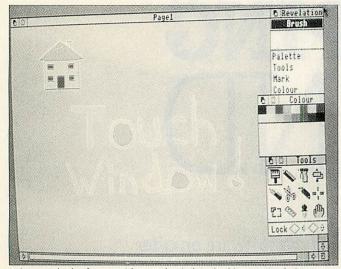
There is a variety of avail-

able pre-reading software. Ted's Adventures consists of two interactive picture story books and Joystick games 1 is made up of five programs designed to teach direction and spatial skills. Street Wise is a suite of games that use pictures of common signs found in everyday life and Everyday Signs involves word matching to test children's ability to distinguish between commonly found words in society.

Both programs help to develop life skills. Ten self-created word sets, that can be adapted to suit the learner's needs are also available. Brilliant Computing's programs always impress me as they are thoughtfully designed, thoroughly tested and are altogether sound.

A new and innovative way of helping children with literacy is the mouse-controlled My First Words. It is a sentence building program where words are used to make and print sentences. Although the sample word banks provided are based on the Ginn reading 360 scheme, a facility is provided that allows teachers to build up word libraries tailored to specific needs. It's a bit like using an on-screen Concept Keyboard and is fun to use.

Gridit is a flexible program with exercises designed to develop spatial awareness plus early numeracy and logical thinking. Children with learning difficulties can explore National Curriculum pre-level one, cause and effect, basic number concepts, as well as



Using standard software with a touch window: in this case Revelation

directions. They particularly enjoy the graded mazes. Like the other Widgit programs mentioned here, Gridit allows further exercises to be designed for curriculum areas other than maths.

Is it possible to have a graphic art program for the visually impaired? Earlybirds 1 for the Archimedes series is a sensibly designed and delightfully easy program to use. For some visually handicapped pupils it is the first graphics program that they have been able to use, according to reports from the Birmingham RCEVH. Clear, bold, mouse driven and virtually crash proof, the standard version of the program is ideal for preschool and reception class children too. Once saved, the pictures can be used in a variety of other programs: Snap, Cut up and planned programs that cover sequencing, tessellation and pelmanism. I thoroughly recommend this suite

#### OVERLAY PROGRAMS

As Arc software for special needs makes increasing use of overlay keyboards, the need for a suitable overlay designer has never been greater. Of the Concept Keyboard overlay programs available for the Arc I recommend two in particular.

For busy teachers who wish to set up an overlay quickly and with little or no fuss, then Conform will do the job. Once an overlay has been created, you can change the font, text style, drop in sprites or Draw files on to the overlay and print it in either A3 or A4. For

more demanding applications where more complex and sophisticated overlays need to be created, Concept Designer is the tool for the task.

As it is totally Risc OS compliant, it is possible to transfer overlays and associated files between applications which helps to reduce the editing of similar overlay files. An overlay file is created by simply pointing, clicking and entering text as appropriate. Once saved, a module is loaded which executes the overlay file. Overlay files can be created for a huge range of Arc software, freeing children from the constraints of the Qwerty keyboard. As a bonus it even comes complete with Touchdata, a Touch Explorer Plus type of application and Softtouch, which emulates a keyboard on screen, enabling overlays to be developed without the need for a Concept Keyboard.

From Pictures to Words is one of the most versatile items of educational software to appear in the past year as it can be used over a huge range of mainstream and special education applications that cover the English National Curriculum (levels 1 to 3). Using an extendable library of 300 pictures and nine activities, the teacher can adapt and create initial letter and spelling activities, such as picture matching with each target word illustrated by its picture. It is suited to older pupils with learning difficulties and particularly ESL children.

Screenplay is another program designed for teachers to create their own exercises. It provides simple animation and movement on a plain background which can be used for visual stimulation and cognitive development.

With Screenplay you can use background pictures and add foreground sprites to produce a collage, or move and animate pictures with full control over the size, speed, position and movement path. The program is simple enough for primary children to operate. A number of illustrative exercises are provided with the program which act as stimulus for new activities created by the teacher. This provides an opportunity excellent language development and discovery of cause and effect as SEN children can control the progress of picture sequences and animations.

#### MATHS HELP

Lastly, to help you get the best out of IT in maths, Northern Micromedia produces a number of guides spawned from the NCET/NORIC Mathematics, IT and Special Needs project. These materials support SEN children aged 9 to 13, learning maths by the use of IT.

The ideas are imminently transferrable to the Archimedes and A3000. Handling Data - An Introduction uses Grass (BBC B) data files and associated workcards to build through the stages of data handling within the National Curriculum.

Roamer Maths aims to introduce children to Logo type activities by using the Valiant Roamer. The activities are divided into 'people activities', for the children to do and 'Roamer activities', designed to be explored with a Roamer or similar device. As an extension many of these activities have been replicated for screen Logo. A disc of these files is included in the pack for Archimedes Logotron Logo.

Each of these packs leaves plenty of scope for teachers to explore. Of the other four packs in the suite: Learning About Shape, Learning About Symmetry, How Can 1?...An Approach To Logo, and Number Games; each is based on specific BBC B software although many of the ideas are equally valid for Archimedes users. The whole suite represents a worthwhile investment if you have both types of computer on site.

In the hands of a skilful teacher this range of IT-based activities will help deliver much of the maths National Curriculum for children with learning difficulties.

#### PRODUCT DETAILS

Products: Conform, Phases 2, My World, Supplier: Northwest SEMERC, Tel: (061) 627 4469 Price: £15

Products: Clip Art 1, Borders 1 & 2, Christmas Disc, Hungry Caterpillar Supplier: Northwest SEMERC Price: £7.50

Products: First Steps, Switch On, Joystick Games 1, Everyday Signs Supplier: Brilliant Computing Tel: (0274) 497617 Price: £13.35

Products: Ted's Adventures, Touch Games 1, Streetwise Supplier: Brilliant Computing Price: £15

Products: Earlybirds1, Snap, CutUp Supplier: IT Service Tel: (0527) 570566 Price: £25, £12.50 and £15 respectively

Products: From pictures to words, Screen play, Gridit Supplier: Widgit Software Tel: (0926) 885303 Price: £35, £35 and £30 respectively

Product: Concept Designer Supplier: Longman Logotron Tel: (0223) 425558 Price: £24

Product: My First Words Supplier: Cambridgeshire Software House Tel: (0480) 67945 Price: £29.95 includes site licence

**Products: Mathematics Special** Supplier: Northern Micro Media Tel: 091-270 0424 Price: £30 for set Individual prices: Learning about Symmetry £6, Number Games £4.50, How can I?... An approach to Logo £7, Others all £5 each

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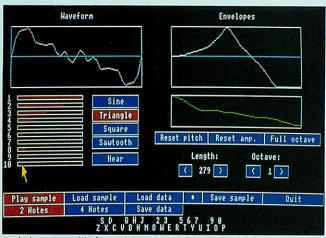


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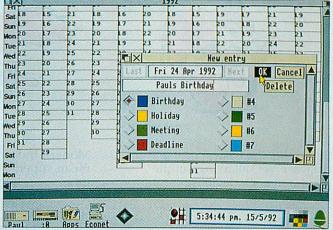


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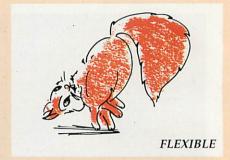




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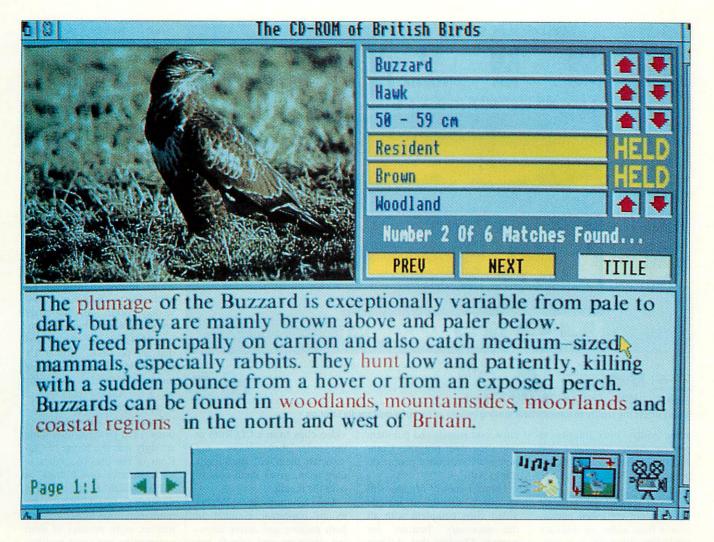
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# ACTION REPLAY

Acorn Replay allows full motion video on an A3000 or Archimedes. Chris Drage looks at the educational benefits and compares it to the Apple QuickTime system

hildren's attention can be captured easily by moving images - which, after all, they are used to seeing on TV every day. So it isn't surprising that full motion video (FMV) is now being incorporated into multimedia solutions for schools, effectively bringing 'desktop video' into the classroom.

Full motion video isn't new, of course - Laservision discs and overlay cards offering 'interactive' video are already available. This is

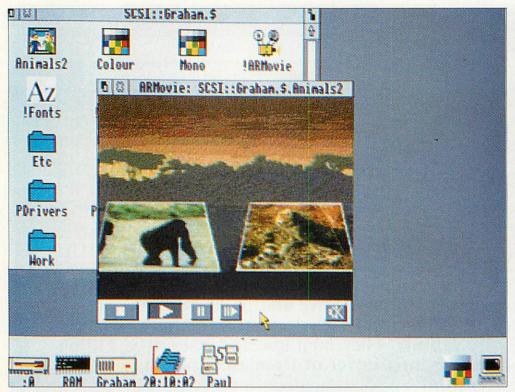
admirably illustrated by the British Nuclear Fuels' Energy and Mathematics video discs.

But, with an increasing number of educational establishments adopting CD-Rom as the standard for storing and diplaying multimedia applications in the classroom. Adding a video film clip can bring a new dimension to the information a teacher is trying to impart - with the old saying 'a picture says a thousand words' holding true. In terms of CD-Rom developments, since there are limits on the current trend of passive, information-providing systems that will end up in libraries, the moving image could be just the catalyst needed to speed up the demand for CD-Rom technology in schools.

Recently, Acorn and Apple both released FMV systems. Both permit digitised video to be run via a CD-Rom player on standard platforms, with no additional hardware costs. The Acorn Replay system (as described in BAU April 92) runs on any Risc OS machine (BBC A3000 or Archimedes) continuously displaying video at 12.5 fps (frames per second) with simultaneous sound.

So far, Replay has only been made available to software developers, since the level of hardware needed to make the sequences is very expensive. Apple's QuickTime system is initially available to all potential users as an extension of the operating system.

The reason for these FMV developments is essentially to



Replay offers the facility to interact with moving images as part of a multimedia solution

allow video film images to become more affordable and accessible. Neither the Acorn nor Apple FMV systems are restricted to relatively slow CD-Rom technology, because both feature enhanced performance from either an ordinary hard disc drive or a magnioptical disc.

Floppy discs, however, are out of the question because the access speed and the amount of data which can be held (about 12 seconds of 12.5fps movie on an 800K disc) are inadequate.

#### **SOFTWARE**

As important as the hardware developments are, they are really only a means to an end. It is the software which will dictate the future success of full motion video. Multimedia publishers in the Archimedes market, Longman Logotron (Magpie) and Oak Solutions (Genesis) both feel that FMV should simply be another form of illustrative information to be used by children in their own multimedia work. As Christopher Roper, Longman Logotron's managing director said: 'Multimedia should be something children do rather than have done to them. We see multimedia coming into its own when children can make videos and take digital video clips, add sounds and put them into their own projects. Computers are machines people do things with'.

Future issues of Magpie will include a facility to include video clips complete with all the necessary 'buttons' for control. The fact that children can take, select and paste video clips from a CD-Rom in the order they choose, and associate them with the sounds they want, gives them control over the media.

Oak Solutions sees Replay as an important element in both passive and active learning situations and already has development version

Genesis which can handle Replay files. Genesis has the advantage of also providing a scripting language which provides a great deal of control over developing large, sophisticated applications.

Anglia Television believes Replay will be significant in opening up the kind of possibilities that Laservision seemed to present, but at a much more economical price. Anglia's Peter Stibbons said: 'We are certainly not giving up Laservision developments as it still presents the best quality, full-screen, moving image to date. When one wants to use movement for explanatory purposes, then Replay offers an important option. We now have a number of levels of explanation that are possible.' Anglia TV is developing CD-Roms of movie clips and is designing its Key Author package to accept Replay files.

Interactive Learning Productions' Fred Granger feels quite strongly that the future of CD-Rom in the classroom lies in its interactive possibilities, as ILP's British Birds CD-Rom illustrates. In addition to the more usual encylopaedic information, eight minutes of short video clips are used to illustrate those things which the

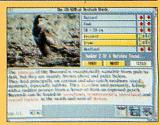
#### **ACORN REPLAY**

Acorn Replay was developed by Roger Wilson and his team at Acorn and supports simultaneous audio and video. It is available only to software developers at this time. Coupled with an A5000 and an optimum storage device - like a large hard disc drive, CD-Rom or magneto-optical drive - it presents the best moving digital video yet, running continuously at a fast 25 fps. This is due to the excellent decompression routines and processing speed of the Archimedes, which can suck data from the drive at 2Mb per second displaying it in real-time on a BBC A3000 with 2mb or more of Ram. This is far beyond the capabilities of most computer systems, which resort to expensive hardware to achieve the same result. Therefore, the system is cost-effective to run since even a standard, 2Mb A3000 can display FMV smoothly at 12.5 fps.

Replay can read sound data from disc and play it continuously



without resorting to Ram to store the sound samples prior to output. It offers full clarity at correct pitch and can stop and start at any point in the recording. Replay's only major limitation is the Archimedes maximum display of 256 colours. That apart, Replay is the best full motion video system to date.



#### **APPLE QUICKTIME**

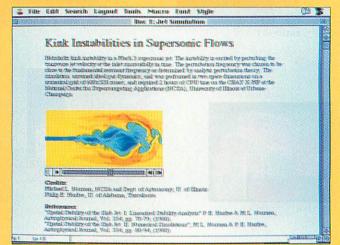
The Apple QuickTime Starter Kit (£99 plus VAT) contains four software utilities required to begin making short movies.

A MoviePlayer program permits QuickTime movies and sound files to be viewed and edited, and features controls such as play, pause and single frame advance. There is a picture compressor and movie converter included to work on still images and dynamic data (such as QuickTime and Pic files). There is also a MovieRecorder program which, when combined with a video capture card (there are several on the market) allows you to make your own movies.

Apple QuickTime differs from Acorn Replay by being an extension of the Macintosh operating system. In this respect it works better under the modular System 7 than the now elderly System 6.07 and as such it will appear in the next release of System 7. Fundamentally an architecture, Quick-Time complies to the Apple concept of 'media integration' (as opposed to 'multimedia'), which permits cut-copy-and-paste between any application and is a common characteristic of Apple computers. This enables applications like WordPerfect 2.0 and Persuasion (DTP) to make use of moving video.

Already a powerful editing program, Premier (Adobe) takes advantage of QuickTime. Being part of the operating system, it makes rewriting applications to incorporate QuickTime's FMV relatively easy as all configurable controls are actually systems calls. Although the memory required is a minimum of 2Mb of Ram, at this level QuickTime will read in video

OB Title Edit Umarpe



frames in segments which can result in 'dropping out' intermediate frames with loss of smoothness although sound replay is constant. With a 4Mb Mac and a CD-Rom storage device, 15 fps is possible, which compares with the 12.5 fps possible on Acorn's Arm2 machines, but hardly matches the cost or performance on Arm3 machines (the A5000). Another restriction is size. QuickTime cur-

rently occupies about 1/16th of the screen area. Any larger and the video becomes too jerky. Quick-Time also works best in the 32,000 colour mode on 68020-30-40 processor Macs, which includes the monochrome Powerbook 140/170 portables, but rules out the Classic and SE models. If limited to 256 colours. QuickTime tries to dither the colours with resulting deterioration of quality.

still image cannot completely convey - the flight of the bird, how it catches its prey, how it feeds and those special features which have evolved in a bird to help it adapt to its surroundings.

With supporting curriculum packs - including workcards, quizzes, maps and a 'scrap book' facility to export data -British Birds should be one to look forward to.

#### INTERACTIVE

Databases of images are for children to use, not to sit goggle-eyed in front of. Their work should include moving

pictures, processed and incorporated into something else to enhance understanding. The real breakthrough will come when children can go out and shoot their own video, edit it and include it in their own projects. Being able to take a video clip of a top athlete executing a long jump, and putting it into a Magpie presentation which includes children's own footage of their attempts at jumping, will enable realistic comparisons of techniques to be made.

Learning the vocabulary and grammar of the media will become important. If children have been through the process of creating their own 'news broadcast', surely they will have a greater understanding of the nature of visual media?

There are several inherent problems, mainly concerned with the huge amounts of data present. For example, stopping a movie and grabbing a one minute sequence would take 60Mb of storage.

Another authoring problem lies in the cost of converting analogue video (from your video player or camcorder) to digital format with sound synchronisation. At present, it costs about £100 per minute of

video, which quite clearly puts it out of the reach of many potential users.

#### CONCLUSION

Although technically inferior to Acorn Replay, Apple QuickTime is available to all users, rather than just software developers, and is accessible via any Macintosh application. The Starter Kit coupled with a video digitiser (for example, VideoSpigot) provides everything the user needs to make short movies.

However, Acorn Replay will become accessible via Magpie and Genesis presentation packages and with an increasing number of CD-Rom applications. At the time of writing both the Replay and Quick-Time modules cost developers nothing, although Acorn is currently looking into a licencing charge.

In terms of the facilities offered and the cost, it is difficult to assess which system comes out ahead overall. With each system it will be thirdparty suppliers providing discs of clip movies who will set the standards that users will become familiar with on their computers. This is simply because few in education have access to the additional expensive hardware required for the converting and storing their own movies.

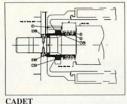
As CD-Rom players become more affordable, the range of video clip material will increase rapidly. The ideal situation of children being able to take their own videos and include them in their own projects is some way off. However, as we progress through the 90s, the moving video image will become an increasingly important element of information handling and presentation in the multimedia aware classroom.

#### INFORMATION

Acorn Computers, tel: (0223) 245200 Apple (UK) Ltd, tel: 081-569 1199 Interactive Learning Productions, tel: 091-261-1255 Longman Logotron, tel: (0223) 323656 Oak Solutions, tel: (0532) 502615 Anglia TV, tel: (0603) 615151



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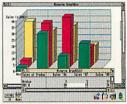


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The latest A3000 upgrade offers you a dual podule expansion. Dave Lawrence finds out more

n Acorn's quest for a cheap Archimedes, the A3000 was inevitably subjected to a number of chops and cuts. The most notable reduction in specification from A300s and A400s were the expansion facilities. The A3000 is the only 32-bit Acorn machine that does not have the ability to fit four podules internally. It has only one external podule and one special internal one. And, to make matters worse, the A3000 internal podule is smaller than the standard Arc expansion podule and so it is not always possible to use it for complicated cards, such as the Aleph One PC card.

The Pres double podule expansion kit solves the problem by providing a two slot backplane for the A3000. It slots on to the back of the existing external podule to allow the user to fit two standard external podules, rather than one. The A3K4 kit, as it is imaginatively called, is

actually an expansion to the Pres A3K3 kit - which allows just one podule to be cased outside the A3000. The A3K4 simply creates space for a second podule to be fitted within the same case, above the other.

To adapt the old A3K3, the original lid is removed and used as the lid on the completed box. Assembling the metal work was very easy: four bolts secure the side panels to the A3K3 and eight plastic studs are used to fix the top and bottom supports. I was sceptical of these to start with, but they seemed to hold the case securely. Finally, the whole caboodle is attached to the rear of the A3000 using the A3K3 screws.

One of Acorn's cuts in the design of the A3000 means that one control signal -Podule select MemC - is not present on the external expansion connector. This means that it is not possible to plug in more than one podule into the slot 'in parallel', so a little jiggery-pokery is called for.

The faint of heart should stop reading here, as to do this you need to remove the lid from your computer and twiddle with its innards. All you really need is a flat bladed screwdriver and a little confidence. If you are lacking either of these, then your local dealer will probably be happy to install the upgrade for you.

In operation everything happened as expected, I tried various combinations of Scan Light, Watford digitiser, Oak SCSI, LaserDirect, Armadillo Sampler, all worked without fault. I could quite imagine many people using the system with either SCSI and Laser-Direct, or a scanner and LaserDirect and an internal IDE drive.

I found the installation to be quick and easy - five minutes at the very most. You do, however, lose a degree of portability and also need to pull your machine eight inches out from the wall. If you are planning to extend your system greatly, then it may be worth moving to a new machine with easier expansion ability.

But if you are sticking with your A3000, and especially if you already have an A3K3, then this product provides a useful way forward.

#### THE INSIDE STORY

Assuming you have braved the project, and are now inside the case, you need to remove one of the Rom chips, plug it into a small carrier (in fact, a chip socket with a flying lead) and replace it in the Rom socket. Then plug a small adaptor board on top of one of the chips (the interface controller, IOC) link this to the Rom carrier with its flying lead, attach a second lead to the IOC board and plug the other end on to the new

The dual backplane can then be installed within the new metalwork and pushed firmly on to the external expansion connector. If everything is connected properly, a small tell-tale LED on the IOC board will light up when the machine is switched on.

My only reservation is that there is no obvious place for the flying lead from the IOC to come out of the rear of the machine and into the podule housing. Pres recommend that you pass the lead between the back metalwork and lid, near the middle of the machine. This will place minimum pressure on the wire.

Short of filing a notch in the metal work, I can see no simple alternative. You may like to wrap a small piece of insulation tape around the wire at the point of entry to reduce any possibility of severing the wire.

#### **PRODUCT DETAILS**

Product: A3000 double podule expansion port Suppliers: Pres Tel: (0276) 72046 Price: £54.95 plus VAT

	-	HEAT CHARLES		nie par la marche de				MCMATCH TO
			Expansion Ca		Printer Driver		TCP/IP Programers Pack TCP/IP Protocol Suite	£50.00 £199.00
			ArVis S-VHS Video Board	£295.00	Midnight Graphics		Twin	£25.00
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4.4	061 766 84	123	Chroma 345 Overlay Board Econet Module	£389.00 £46.00	Epson 24 Sprite Dump	£26.04	Beebug	
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	FAX: 061 766 8	125	Midi Upgrade to I/O Card	£27.00	Star LC10 Sprite Dump	£26.04	Joystick Games	£20.00
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			ROM Expansion Card	£45.00	Star LC200 Sprite Dump	£26.04	Switch On	£20.00
5.5.	Acorn Hardw	are	SCSI Expansion Card (Acorn)	£229.00	Star LC24-200 Sprite Dump	£26.04	Switch On Actions	£20.00
*	A540 inc. 4Mb Ram, 120Mb HD,		New from Ron	aho	Ace Computing		Teds Adventures	£20.00
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100	Arm3, Acorn Multiscan Monitor	£1499.00	Colour Dinitio		Printer PJ (Paintjet)	£14.00	Mah-Jong Patience	£15.00
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	Guide to National Curriculum, Acorn Applications Suite, Pacmania,		opeciai i i	100	BubbleJet - BJ10e/130e	£10.00	Clares Micro Supplie	
0.00	PC Emulator, Genesis, 1st word Plus		A3000 inc. podule housing	£72.30	Cables		Artisan 2	£45.00
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<b>%6.</b>	as above c/w Acorn JP150	£1765.96	Alask 4		Arc - Monitor - 8833 II inc sound Arc - Parallel Printer Cable	£8.65 £5.00	Interdictor II ProArtisan	£25.00 £70.00
*	Inkjet Printer A3000 c/w 2Mb Ram fitted	£1765.96 £599.00	Aleph 1		Keyboard Extender 400/500	£5.00 £7.50	Render Bender 2	£70.00 £99.00
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*	A3000 LC / Acorn Monitor	2042.23	Acorn Colour	£199.00	Blob 1	£18.00	Pipedream 4	£179.00
	as above c/w Acorn Colour Monitor	£855.05	Microvitec Cub 3000	£199.00 £199.00	Blob 2	£18.00	Computer Concepts	
9/4	A3000 LC / Acorn Monitor /		Philips CM8833 II	£199.00	Chick Chase (80 Track Only)	£15.00	AvanteGarde Font Pack	£24.00
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44.	Expansion Card, Acorn Software Suite		Taxan Viking II Mode 23	£749.00	UIM	£14.95	Impression Junior	£70.00
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*			Colour Kit for above	£39.00	Poster	£75.00	Mig29 Fulcrum	£24.00
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	124.00	My World - Skeletons	£7.50
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MicroPower		Phases - Borders disc	£7.50
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# WORD WISE

Want to wax lyrical on your computer? Ian Burley guides you through the multitude of word processing options on the Archimedes

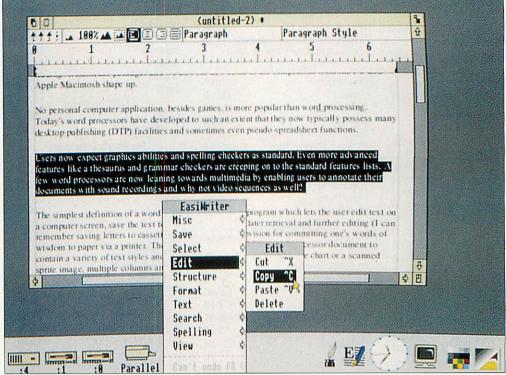
hen was the last time you used a typewriter? I was recently confronted with such an antiquated device in a rather poorly equipped press office and it proved to be something of a culture shock.

If you are about to emerge from the Dark Ages of typewriting and want to move up to word processing or, if you have already reached that stage and want to know what lies beyond the Edit application, there are a multitude of choices open to you. To clarify what's available, we looked at some of the key word processing packages for the Archimedes market. And, of course, this is not the only option: word processors included within other applications such as DTP and spreadsheet packages. first, let's look at what you can expect from word processing.

#### WHAT IS WP?

Apart from games, there are few personal computer applications more popular than word (or text) processing. A word processor allows you to write and edit text on a computer, save the text to a storage medium (hard or floppy disc). It can then be retrieved for further editing, printing or it can be imported into another application.

Most word processing packages contain a variety of text styles and sizes, some illustrations like a Draw file chart or a scanned sprite image, multiple columns and even tabulated data. WP users have come to expect facilities, such as spelling and grammar checkers, a thesaurus, and



Easy Writer provides unpretentious and affordable word processing

#### WP ON OTHER MACHINES

In recent years, Word Perfect has been an institution in the PC world, deposing Wordstar as the best selling PC word processor in the mid-80s. A modified version of Word Perfect is also available for Macintosh users.

Word Perfect has a recommended retail price of £399. When compared with Archimedes packages, such as Easiwriter at £150, this seems extremely expensive. So what are you getting for the hefty price tag?

Well, Word Perfect is currently available in two forms: characterbased and GUI (graphical user interface), the latter designed for Microsoft Windows as well as the Apple Mac. The GUI versions haven't yet earned the universal praise lavished on the original PC character-based versions. Criticism mainly centres around over-complexity which tends to defeat the general ethos of easy-to-use GUIs.

That's not to say Word Perfect lacks features, which include a table of contents generator, multilingual spelling dictionaries, builtin drawing tool, thesaurus, DTPlike text boxes, multiple columns, user-definable macros, and so on.

Word Perfect has good graphics' capabilities and the ability to manipulate text in a variety of ways - rotate it, for example. But the disadvantages are that some

of these effects are not visible in edit mode. Unlike the Archimedes with its Risc OS fonts, Word Perfect can only display a near enough perfect rendition of the page as printed via a non-editable preview mode.

In terms of sales, Word Perfect is still the favourite Windows WP package, despite many poor reviews. The Mac version 2.0, which is cheaper at £299, has been well received, but is up against stiff competition. Word Perfect is certainly a capable package and has many extras thrown in, but whether it's easy enough to use, in order to fully exploit these features is another question.

even graphic capabilities. A few word processors are also leaning towards multimedia by enabling users to annotate their documents with sound recordings, or even video.

The original simple definition of a word processor is easily met by Edit, which is supplied free with all A3000 and Archimedes computers. However, Edit is generally regarded as a text editor rather than a word processor and is better suited as a tool for editing programs and batch files. There is no support for fancy text styles or graphics either. Of course, there is nothing to stop you writing a novel using Edit, but it would be much using easier a purposedesigned word processor.

Until the new version of the Archimedes' operating system, Risc OS 3, appeared with the new A5000, Edit did not even offer word wrap. Many users find Edit indispensable as a handy notepad, always available at a mouse click's notice. But as full-blown word processing goes, much better options are available.

#### FIRST WORD PLUS

First Word Plus is an entrylevel word processor supplied with the Acorn Learning Curve package and was one of the first programs available under Risc OS. Today its age is all too evident.

This word processor was converted from a program originally designed for the IBM PC and Atari ST, running under the Gem desktop environment. The legacy of this conversion is that First Word Plus does not use Risc OS outline fonts nor Risc OS printer drivers. For the serious Archimedes user, these are crucial disadvantages.

However, First Word Plus is otherwise a reasonably well specified 'junior' word processor offering most basic functions, including a spell checker and limited ability to incorporate graphics into documents.

#### **EASIWRITER**

First Word Plus is certainly cheap - it is available for less than £60, but it is a relatively poor investment when compared with, say, EasiWriter.

EasiWriter from Icon Technology can be bought for

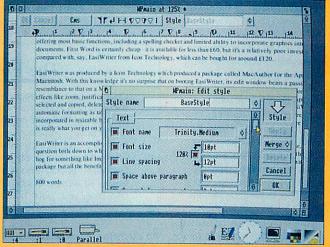
#### MORE THAN JUST WORDS

Ironically, the two most popular 'word processors' for the Archimedes - Impression by Computer Concepts (shown to the right) and Pipedream by Colton Software (shown below) - are not word processors in the true sense of the word. Impression is a DTP package and Pipedream is an enhanced spreadsheet and database program. However, both are equipped for the specific requirements of word processing and are probably used for that purpose more than any other independent packages.

When Computer Concepts originally started to think about an Archimedes' successor to its enormously popular Wordwise word processor for the BBC micro, it decided, with some justification, that the Archimedes' Risc OS operating system, outline fonts and graphical user interface desktop environment demanded a DTP-like solution. DTP was already established on the Apple Mac and PC compatibles, but DTP was too slow for everyday use.

Instead, Mac and PC DTP users resorted to generic word processors for text preparation and then exported the text to their DTP applications for final layout and printing. Computer Concepts decided that by using optimised machine code programming to harness the power of the Archimedes' Risc processor, they could produce a DTP package fast enough to be used as an everyday word processor. By and large, that's just what Impression is.

Impression (now at release 2) offers immensely powerful text style selections which fully exploit Acorn's advanced Risc OS outline font technology. On the debit side, the complexity of Impression



styles takes some getting used to. However, an improvement has been the addition of standardised style parameters - such as bold. italic and underline - called 'effects'. It would be nice to see a development of Impression which adopted the current PC Windows trend of iconised 'button' bars for instantly accessible effects.

Impression has excellent layout and graphics' capabilities and a smart spell checker which is very good at finding sensible alternative word spellings. Being a framebased DTP package, it's inconceivable that you wouldn't be able to produce a document page, liberally sprinkled with a variety of text styles and graphics, precisely how you wanted it to look. However, Impression is a touch of overkill for merely writing quick notes and it will take time for a novice to fully exploit the package.

Pipedream on the other hand has now reached release 4.0. It is the latest in a long line of developments which started as View Professional on the eight-bit BBC

micro. Pipedream, like View, has always been a spreadsheet program with a word processor 'shell'. The philosophy is that spreadsheet cells need not be restricted to numbers, formulae or sheet annotations, but should accommodate formatted word processor text as well.

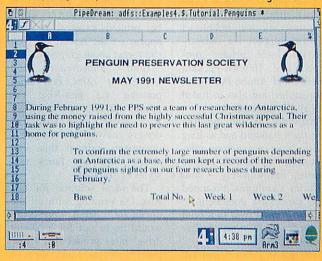
To achieve this aim, Colton Software endowed its package with word processing functions such as a versatile search and replace facility, spell checker, text format ruler, headers, footers, margins, word wrap, justification, page numbering, mail merge and indexing.

As Pipedream is an elaborate compromise between spreadsheet and word processor, it doesn't always behave as you would expect a word processor to.

Pipedream's biggest failing is its line-orientated text format which severely restricts text selection and editing. Text styles cannot be mixed on the same line without resorting to the complications of separate columns. On the other hand, this is partially offset by Pipedream's inherent ability to mix text and working spreadsheet sections. As a spreadsheet package, control over columns is comprehensive, though a minus point is that you cannot insert tabs without creating a new column.

There is no automatically spaced tabulation facility, in the style of EasiWriter. Also text styles, graphics and layout options are basic, especially when compared with Impression.

But, with careful use, Pipedream is capable of generating some impressive looking documents which can include sprite or Draw file illustrations. It's just a bit quirky to use.



#### **EDUCATIONAL WP**

PenDown (shown on the right) is a fully Risc-OS compliant word processor which has become the de facto standard text processor in schools with BBC A3000 or Archimedes computers.

A full-functioned word processor, PenDown comes with six fonts, that can be scaled up to one-letter-per-page in any combination. PenDown accepts sprites and draw files, either of which may be sized on-screen.

The powerful spelling checker also offers spelling suggestions and a word list facility allows specific dictionaries to be created. Best of all, *PenDown* can be configured for a variety of user levels making it suitable for pupils aged eight upwards. Layout facilities include justification, centring, line spacing, multiple rulers and variable underline.

PenDown offers schools a smooth, consistent and powerful writing environment which which ideally complements the National Curriculum. Children used to BBC Pendown appreciate the large spelling dictionary and the ability to display their chosen pictures and fonts in almost any size and see the printed results matching those displayed on screen.

around £120. Icon produced a package called *MacAuthor* for the Apple Macintosh. With this knowledge it's no surprise that on booting-up *EasiWriter* its edit window bears a passing resemblance to a Mac.

Everything looks simple and easy; there are unpretentious icon buttons for basic effects like zoom, justification and centering, plus an simple horizontal ruler. Several paragraphs can be selected and copied, deleted or moved together as one lump.

Table handling is particularly good on *EasiWriter* with automatic formatting as tables are filled. There is also a good multi-lingual spelling checker. Graphics are easily incorporated in resized boxes; printing is handled by the usual Risc OS drivers, meaning that what you see on screen is really what you get on your hard copy. Unfortunately, there is no fast draft printing option.

EasiWriter is an accomplished, medium-specification word processor which is affordable and easy to use. The

One day a baby Elephant was born. His mummy thought of a name for him. She said I know I will call him Bobby. The next day Mrs Elephant bought a ball for Bobby. Bobby played with the ball. Mrs Elephant said Bobby come and eat some leaves where from said Bobby. From this tree said Mrs Elephant. Bobby liked the leaves. After Bobby had eaten 20 leaves, Bobby's mummy said you can go and play with your ball. So Bobby went off and play with your ball.

An alternative, Phase#2 is basically a type in/print out word processor which aims to be easy to use, possessing the ability to display text in six fixed sizes and to enable pictures and borders to be popped into the text area.

It directly supports the child with special educational needs in the mainstream classroom environment, although several authorities have opted to make *Phases#2* their standard primary word processor.

A designer option permits teachers to fix aspects of the program to ensure consistency in layout. It is suitable for children with moderate learning difficulties (including the visually impaired) since it provides a wide choice of text colours, screen colours and print sizes. Discs of borders and graphic images on specific themes are available and they encourage children to experiment. With the growing library of support materials, the *Phases* family should provide a versatile introductory word processor for those tackling key stages one and two.

Other educational packages which have WP facilities include ESM's Desktop Folio DTP package and Oak Solutions' Genesis 2, the hypermedia package.

Chris Drage

question for the user is whether to choose a traditional package like this, or go for a DTP package which offers WP facilities with the benefits of superior document layout capabilities.

#### PRINTING

Another factor to bear in mind when choosing a word processor is printing capabilities. Risc OS will serve most types of dot matrix printer, including the latest ink and bubble-jet devices. Support for industry standard laser printer protocols, like Hewlett-Packard Laserjet and Adobe PostScript compatibles, are also included with all Archimedes.

PostScript is the printing industry's standard and as long as you have a matching configuration – not always easy to achieve, unfortunately – you can print a complex illustrated word processed document to disc and hand it over to a print bureau for professional quality typesetting.

Dot matrix printers and HP Laserjet compatibles can be the slowest option when printing documents which use Archimedes Risc OS outline fonts and contain graphics. This is because the document is sent to the printer as one big graphic picture, perhaps containing more than 1Mb of data per page. However, by using a draft printing mode, which uses the printer's built in character set, printing can be very fast indeed. The catch is that complex documents won't be printed exactly as they appear on the screen and you can forget about graphics.

Both Pipedream and Impression offer fast draft printing via non-Risc OS printer drivers. First Word Plus doesn't use Risc OS drivers anyway. Unfortunately documents printed this way won't show any fancy text styles or graphics.

The ideal solution for fast Risc OS printing with all the document detail preserved would be to opt for a 'direct drive' laser printer like Computer Concepts' LaserDirect or ArcLaser from Calligraph.

#### CONCLUSION

Your choice of WP package will depend very much on the sort of documentation you want to produce. For the odd letter, then the 'free' *Edit* program on your A3000/Archimedes is all you need.

While First Word Plus is a better option, albeit outdated, it can offer more WP facilities and, if you buy an Acorn Learning Curve package, it is 'free' anyway. The latest information we have from Acorn is that this program may be replaced in the near future with a better WP package for the Learning Curve.

For more serious work, it is worth considering a package which offers more than just word processing. Even if you buy a good, dedicated package such as *Easiwriter*, you are not that far away from the cost of a DTP package. After all, it is a natural progression from word processing to document layout, therefore a DTP package such as *Impression* or *Ovation* may be a better choice in the long run.

Similarly, if you want to integrate words with numbers, in business reports for example, then *Pipedream 4* makes a good choice.

#### PRODUCT DETAILS

Product: EasiWriter Supplier: Icon Technology Tel: (0533) 546225 Price: £150 plus VAT

Product: Pipedream Supplier: Colton Software Tel: (0223) 311881 Price: £196 plus VAT

Product: Impression Supplier: Computer Concepts Tel: (0442) 63933 Price: £169 plus VAT

Product: Pendown Supplier: Longman Logotron Tel: (0223) 42558 Price: £54 plus VAT

Product: Phrase#2 Supplier: Northwest Semerc Tel: 061- 627 4469 Price: £15 plus VAT

Product: First Word Plus Supplier: Acorn suppliers Tel: (0223) 245200 Price: Around £63 plus VAT

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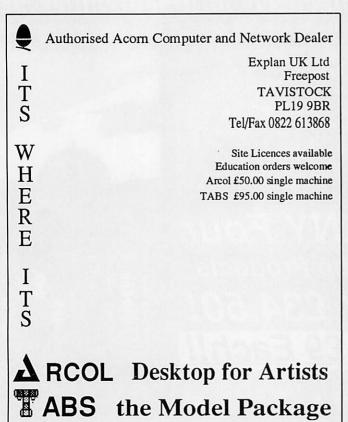
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Winner of the Best Printer in the recent Computer Shopper Awards, the Cannon BJ10ex printer has revolutionised the small printer market. It offers 360 dpi, near laser printer quality, on plain A4 paper, in an incredibly compact and lightweight housing. Unfortunately the existing RISC OS printer drivers, based on the standard Acorn drivers, have definitely been in the slow lane, locking your computer up for the entire print process, often up to ten minutes per page.

Computer Concepts have now created a set of RISC OS printer drivers, called TurboDrivers, that are optimised for the Cannon BJI0ex printer. The result is the perfect combination of budget printer and RISC OS printer driver, able to print full 360 dpi high resolution pages at a quality superior to that available from any dot matrix printer.

The TurboDrivers not only print the pages faster, but give control back sooner - up to ten times quicker. The table shows the time taken to print and the time the computer is occupied for some typical example pages.



The TurboDrivers print faster on an ARM2 machine than traditional drivers on an ARM3 machine. In addition they can send the print data to disc and then print from disc in the background, so the computer and almost all memory remains free for other uses, while the printer gets on with printing.





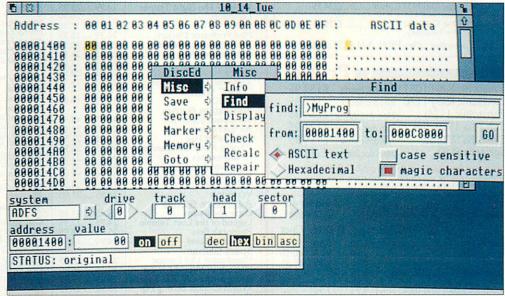
# TO THE RESCUE

Ever deleted a useful file, or trampled on a vital disc? Dave Acton finds out how Disc Rescue can save the day

here comes that dreadful moment in every computer user's life when you delete that vital file. And what is worse, you didn't make a backup copy. Oops.

Eight-bit BBC users have had the benefit of disc recovery programs for years, but A3000 and Archimedes users have not been so fortunate. Now help is at hand, in the form of Archimedes Disc Rescue from Look Systems.

The box below highlights the main ways that data can be lost and how Disc Rescue can help. At the heart of the package is DiscEd - a disc sector editor. A section of the disc is shown in a window as hex and Ascii data and you can skip around the disc using the tool panel beneath. You can also choose how many disc bytes appear (256 to 2048) - handy if you've got a large monitor. Of course, you can edit individual bytes and resave them and there are also search



Searching for a lost program with DiscEd, which is at the heart of the rescue package

facilities, so you can look for particular files (invaluable when recovering lost data).

Other disc formats can be accommodated simply by dragging their disc 'records'

on to DiscEd (Atari, PC and Acorn DFS formats are supplied). You can also save the disc record - the manual particularly recommends this for hard discs, since if the copy of the record on the disc becomes corrupt, the disc editor won't know how to access it. Good advice indeed!

With DiscEd comes a band of other utilities for putting right faulty discs. While reviewing the product, I deliberately trampled on discs in a variety of ways and was able to recover lost data on all but one occasion - a pretty good success rate.

#### FOUR WAYS TO LOSE YOUR FILES

#### Disc Errors

Physical faults on the disc are bound to happen occasionally. In such cases, Recover can be used as above to extract the data, including errors. Again, this is the most you can realistically expect.

Depending on the type of file you may still need to do some manipulation of the recovered data to edit out the dodgy bits.

#### Deletion

The easiest way to lose a file is to delete it by mistake. The Disc Rescue manual is full of good advice about taking backups but if the worst happens, there is hope.

DiscEd can locate files quickly if you know a string to look for, such as a variable name or word. The details of where the file is can be copied from the editor to Recover, which will then permit recovery.

Arc files are really deleted (unlike PC files which are simply marked as deleted) and recovery is unavoidably awkward. Furthermore, E (and now F on the A5000) formats permit files to become 'fragmented'.

Undeleting such a file means finding all the bits with DiscEd and recovering them individually. Although Disc Rescue does all it can, there may be no way to avoid the detective work.

#### **Broken Directory**

If a directory gets trampled on, this dreaded error message can appear. Any files in it will still be intact, but inaccessible. The RepairDir utility is fairly good at sorting out mangled directories, although if they are in a particularly bad way you may have to search out the contents individually, using DiscEd. There is a special option when \$ itself

becomes corrupted and the manual wisely advises you not to store files in the root directory as this is accessed most often and is therefore most prone to errors.

#### **Corrupt Map**

The disc map is an area on the disc which describes which sectors are free. Dodgy sectors can also be 'mapped out' in the map. There are two sorts - old (on L and D discs) and new (on E and F discs) and FixMap can cope with both.

Only old maps can be rebuilt by going through the directory structure (which FixMap duly does). New maps are stored twice so FixMap can sometimes correct a map fault by replacing the bad copy with the good. Also, DiscEd offers a Recalc menu that can be used to 'correct' checksum errors in maps, directories and so on.

#### CONCLUSION

Disc Rescue is a well-written, highly usable suite of utilities with a window-based disc editor at the core and an excellent manual. It is the only commercial package available at the moment, but thankfully it is also a good one.

#### **PRODUCT DETAILS**

**Product: Archimedes Disc** Rescue Supplier: Look Systems, 47 Goodhale Road, Bowthorpe, Norwich NR5 9AY Tel: (0603) 764114 Machines: All Risc OS machines Price: £35

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# GAIVIE SHO

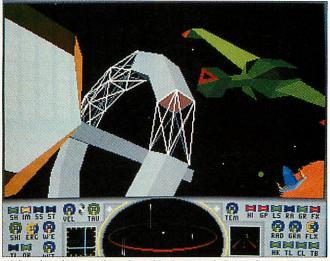
ark, a game has been born and, lo, The Fourth Dimension is to publish it. Black Angel looks like a space shoot-em-up with plenty of high-tech gadgetry and good graphics. The information from the publisher, however, is written in a quasibiblical verse that makes deciphering any sort of description about the plot or features of the game somewhat tricky.

Presumably, this is the intended effect, meant to wind us all up into mega suspense. The author, Gordon Key, has been working on the game for nearly a year and already has feathers, such as the car game E-Type and shoot-em-up Apocalypse, in his cap. However, The Fourth Dimension must think highly of Black Angel because it plans to launch the game in July at the fairly steep price of £34.95.

Last month the French games company, Eterna, demonstrated its Zarch-style graphics game to us (as reported in last month's Game Show) which will be released at the BBC Acorn User Show at Wembley in October.

Entitled Aldebaran, it is a slick-looking 3D space game which is loosely based on the plot of Star Wars and is, indeed, quite reminiscent of Zarch in places, complete with patchwork landscape and a hovering space-craft controlled by the mouse. Your ultimate task is to halt the destructive activities of aliens who apparently have nothing better to do than vandalise the nearest star by shooting large nuclear 'thingies' at it in an effort to spark off a good firework display of galactic proportions something the inhabitants of Aldebaran, the nearest planet, are a bit nervous about.

But flying around a piece of patchwork is only half the game. You must also travel to several different planets, à la Elite, and explore your own spaceship room-by-room in the style of an adventure game.



High-tech gadgetry and good graphics in TFD's Black Angel

The game play promises to be equivalent to a cross between Elite and Zarch, with 256 Elite-style missions to be completed across 15 planets. But, while in Elite you might be given an object at one planet to be dropped off on another, in Aldebaran you first have to find the object on the planet's surface by flying round in the ship to look for it.

Another feature of the game is that it is played in real time: you only have one week to finish the mission, though obviously you can always try again if at first you don't succeed! Also, a few extra touches have been added in an attempt to enhance the Zarch landscape, such as waves in the water areas and lightning. At the end of the game there is a Death Star scene where you have to pilot your ship along a trench and fire torpedoes into the centre. Aldebaran comes on three discs and will retail for less than £40.

A few months ago we mentioned the underwater action game James Pond from Krisalis Software and hinted that the built-in cheat mode can be accessed by using the name of a Swedish guitar player. Admittedly this does not give you much chance - as BAU reader Paul Gardner discovered, having 'exhausted the

encyclopedia and the music section of the school library and local library'. Fortunately for Paul and those in his position, Anneli Carlborg has written in from Märsta, Stockholm in Sweden to provide the missing information. Play the game, pause it using TAB and then type YNGWIE J MALMS-TEEN, including the spaces. Easy, eh? This will render Mr Pond invincible.

Twelve-year-old Samantha Clarke from Doncaster has sent in some useful code words you might like to type in while playing the caveman platform game Chuck Rock, from Krisalis. When Chuck and company pick up their gear and start to make some music it is time to type in either or both of these words: ERMINTRUDE will Chuck with an iron constitution that protects him from all the baddies and anything else that goes squelch and plop; PINKYANDPERKY turns Mr Rock into a psychedelic longhaired hippy guitarist who can get really high by flying.

Arxe Systems, the publisher of Blitz, Bambuzle and the shoot-em-up game Scorpius (hopefully out before the BBC Acorn User Show), has announced some more projects it has on the go. First up is an arcade adventure game that sounds a lot like the old classic Gauntlet and currently has the working title Glove. Gauntlet came out in the mid-80s, first in the arcades and then on the home computer market, and took the games' world by storm. It topped the charts and attracted plenty of favourable reviews, many containing the word 'original'.

The Gauntlet castle is viewed from above and up to four players, each with differing abilities, can run around collecting treasure and food while battling with skeletons and other fantasy-style creatures in an attempt to make for the exit.

Its multi-player facility is the most attractive feature of the game and teamwork becomes almost strategic as success relies on deploying the players' various characteristics, such as strength, magical powers, and armour, at appropriate times. With any luck Glove will closely resemble Gauntlet. Its release should be in August.

We will be able to see part of the game before then, as Arxe will be including a twolevel playable demo of Glove with a product that is to be in early June, released described as 'the ultimate joystick interface'. There are two joystick interfaces presently on the market, one from Vertical Twist and one from RTFM. Despite being superior, dealers have experienced problems in obtaining stocks of the former.

The Arxe interface will cater for up to four joysticks, making it conveniently perfect for games such as Glove. In addition to Atari and Amiga sticks it will also be compatible with the Sega joystick, which brings with it the benefit of two independent fire buttons. This will allow all Arc players to enjoy games such as Nevryon, to the maximum.

Next month, don't miss our look at Quest for Gold.

Sam Greenhill

#### MAH JONG - THE **GAME**

Cambridge International Software Tel: 071-226 3340 Risc OS machines £22.95

Many years ago, I used to play Mah Jong with my parents using a very old, original Chinese set, complete with ivory pieces and mahogany racks. Admittedly, I have only played rarely since then, but I was very interested to discover CIS's Mah Jong Patience, released last year, and I played the game extensively.

Mah Jong is an old Chinese game which is similar to the card game Rummy, although much more elegant. And so the Archimedes, with its excellent graphics, should make an good basis for the definitive computer version of Mah Jong.

But sadly, the standard set by Mah Jong Patience has not been continued with The Game. An appalling title

page leads to a list of seven questions that have you immediately diving for the badly-written manual. Apparently the game is 'European Mah Jong' and features a whole host of extra bells and whistles over the traditional Chinese version, all of which are unnecessary.

The game play continues in the same vein: a cluttered nondesktop mode 12 screen, garish tiles, unfriendly interface, unhelpful help...

At the very least I was disappointed with the standard of graphics. With a little more time, a graphic artist and mode 15, they could have worked wonders. The user interface? Well, I ask you, when selecting an option from a menu, do you expect to use the left mouse button to scroll up, the right for down and the middle to select?

Much of Mah Jong is based on tradition; the look and feel of the pieces, and so on. Without an attempt to re-create these - this version doesn't even come close - much of the original atmosphere is lost.



Mah Jong - but does it live up to the traditions of the original?

Another obvious omission is in the game play itself. The traditional Mah Yong is a game for four players which could be fun. However, with this version, there is no way to let anyone else play as the computer assumes control of the other three hands.

As to how well the computer plays, I cannot say as I could not bring myself to play a complete game. Unless you're a hardened Mah Jong nut, with a good understanding of the European version, I suggest that you give this one a miss. Even if you are, I bet you would feel a bit silly whistling to vourself when the corners of the wall are removed. Maybe one day someone will write a decent version of this game, with the original rules Chinese graphics. If they do, it may well prove a hit.

**Graham Blakely** 

#### **NEBULUS**

Krisalis Software. Tel: (0709) 372290 Risc OS machines £25.99

Continuing its excellent policy of siphoning off all the best games from other formats, Krisalis has produced the Archimedes version of a game which has been phenomenally successful across the board.

Nebulus is actually a bit of a dinosaur in terms of computer games, first appearing in 1988. But the fact that it is still around is testimony to the its astonishingly playability and addictive nature.

The graphics are a bit bland but cute enough, while sound is the usual collection of unearthly samples. Your job is to climb a series of cylindrical towers which protrude from the ocean, but this is not done in the usual flat ladders and levels way. Your third person viewpoint rotates around an axis which runs down the middle of the



Nebulus - time is your worst enemy with this game

tower, so your character stays still horizontally, while the rest of the world literally revolves around him.

This means that for the first five minutes you will be completely disorientated. After that you had better have some time to spare, since nothing short of a hurricane is likely to make you move away from your screen for the next few hours.

In the form of an unusually agile frog, you must make your way upwards by negotiating a treacherous system of platforms and lifts. It is possible to go through the tower and out the other side by entering one of many doors in the wall. But, unless you know what you're doing, this can land you in some tricky situations, sometimes shoving you out into mid-air, with nothing between you and the water below. Various bouncing blobs will impede your progress but most of them will respond nicely to a blast from your

gun. Time is your worst enemy and playing Nebulus is a bit like playing snakes and ladders against the clock as you frantically try to climb up, but inevitably fall down, in your haste. Each level has a graphical theme and upon completion you have the chance to win bonus points by catching fish. This takes place as you zoom through five levels of parallax in your froggy submarine - although why a frog would ever need a submarine is never called into question.

Other nice touches include the rippling effect in the water, which also has a shimmering reflection of the action above, and some funky music which is played between games. On the down side it is very irritating that there is no way to skip levels once you have got the hang of them.

Nebulus has the air of an early 16-bit release but, nonetheless Arc players have a treat in store.

**Mat Tizard** 

#### **DREADNOUGHTS**

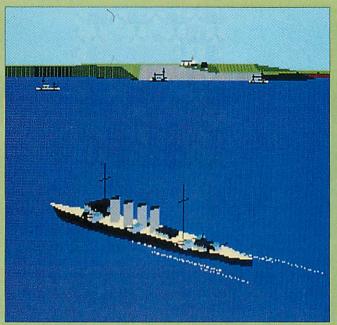
**Turcan Research Systems** Tel: 071-625 8455 Risc OS machines £34.95

Any naval buff will tell you that iron battleships reflected the pinnacle of sea power for almost a century. And this games simulation from Turcan Research adequately presents the might and majesty of that age.

Turcan, who produced the excellent Waterloo! has created three discs that trace the history of iron battleships through 50 years of naval engagements. Ironclads and Bismarck are available separately and create scenes from the late nineteenth/early twentieth and World War Two periods respectively.

However, the most varied disc in terms of scenarios and types of engagement is Dreadnoughts, dealing with World War One naval power.

Dreadnoughts' broad range of scenarios is sure to tax the skill of most players. It is probably best to cut your teeth on the Seatrial program, which recreates a channel battle between fast and light naval cruisers. The great thing about Seatrial is that you can get to grips with the information and tactics you will need for future, larger engagements.



The Dreadnoughts Simulation helps you to capture the drama of iron battleship warfare on the high seas, with non-stop live action

You have numerous choices, including choosing sides and employing the use of the computer to play the opposition. Positioning and communications soon become clear once the scenario starts.

There is no point in signalling ships or requesting sightings when you are not sure of your command responsibilities, or how far you are from the enemy. So there are frequent communications from the fleet and a fully accurate sea chart that comes with the game. Simple scenarios, such as Seatrial, prove to be excellent confidence boosters for your tactical prowess. The command structure enables full control over both ship and fleet and the player is free to engage, withdraw, request positions, take the helm and even abandon ship.

This is where the real fun comes in. Suddenly you realise that you are in full command of a battlefleet, which is no small undertaking in a battle such as Jutland.

The growing excitement is reflected in the excellent graphics and sound effects. Indeed, the level of realism in the various battle scenes is nothing short of fantastic.

Engagements are run in six-minute cycles and usually manage to end at the historically correct time. Victory, which is often difficult to determine in naval warfare, is calculated on a fairly reliable points system.

Attention to detail is the trademark of a Turcan progam and this one is no exception. Everything is accounted for, from damage control to near collisions and even raging gunfire. The result is a wide range of scenes that reflect the confusion and excitement of battleship warfare.

However, doing some background reading is useful. The manual provides most of the information you need to play the game, but if you're going to be Beatty for a day, then you may need just a little extra tactical information up your sleeve.

All in all, an enjoyable game, not just for the nonstop action but also for its attention to realism. But it does live up to the Turcan reputation - if you don't know your history then read, read, read!

**Matt Prior** 

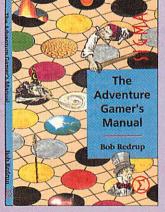
#### **BOOK REVIEW**

Adventure Gamers' Manual by Bob Redrup Sigma Press Tel: (0625) 531035 £12.95

The appearance of Magnetic Scroll's adventures on the Archimedes, has really adventuring inspired my instincts again. And so I was very interested to see Bob Redrup's book, The Adventure Gamers' Manual.

The manual is really aimed at newcomers to the adventure games world, and I would say there would be little of use here to hardened adventure hacks.

It covers a wide range of adventures, focusing mainly on those for Acorn machines,



although others are covered. Bob has a firm background in games of all sorts and he dwells on some of the most common problems encountered in adventures, without revealing too many secrets of any particular game.

In other words, the book contains many pointers and ideas on how to go about solving adventures, but leaves the actual steps down to you.

More specifically there are sections about getting started, what to look for in location descriptions, mapping techniques including the dreaded maze, and many sorts of puzzles, both single and chained. The concluding chapter contains a list and description of the author's favourite adventures along with a number of recommended games.

Bob's background has enabled him to draw on many examples from different games to illustrate points and, as far as I can tell, he has missed very little out. Don't be put off by the inclusion of details



The book could help you enjoy adventures like Guild of Thieves

from games you do not know. It is the techniques, rather than the actual points, that prove the most useful to the reader.

This book is likely to appeal all those users who possess the adventuring spirit, like the idea of adventuring, but haven't got a clue how to go about it.

**Dave Lawrence** 

#### **POIZONE**

Eterna Tel: (0933) 279300 Risc OS machines £19.95 plus £1.50 p&p

Take an eight-bit classic game, add some fancy graphics and sound and you have *Poizone*. Based on the Beeb game, *Pengo*, *Poizone* puts you in the flippers of Zozo the penguin, whose task is to save the planet from ecological disaster.

The game is set in a scrolling world, inhabited by various animated splodges who would prefer to see a world filled with CFCs and radioactive waste, rather than the thriving green land you must strive to create.

All kinds of nasty substances have to be cleaned up by crushing them against, or squashing them between, blocks which are littered around the land. Occasionally, special blocks and squares appear that will either help or hinder Zozo in



If you enjoyed playing Pengo on the Beeb, you'll love Poizone on the Arc

his quest. Diamond blocks for example, will produce a bonus when arranged correctly, in a similar way to the original *Pengo* game. Some blocks will slow Zozo down and it is up to the player to find out which blocks have what effect.

As well as contending with a short time limit, Zozo must avoid or destroy the nasties that roam each level. Making contact with a nasty doesn't kill you, but it will stun you for a few seconds.

To start with, *Poizone* is relatively easy and it doesn't take long to complete the first couple of screens. After that the number of blocks increases and it takes as much time to work out how to dispose of

them as it does to demolish them in the first place.

Each block type must be destroyed in a certain way: don't crush the radioactive blocks together! This adds a 'Reptonish' puzzle element to the game which greatly improves the playability. When five levels are complete (there are 90 in all) there is a bonus level where you get the chance to squash as many nasties as possible. A password is shown so that you can skip the earlier levels if you wish.

Poizone is created in 256 colour, with lots of animated bits. Although they don't exactly stretch the Arc capabilities, they do suit the game well. Sound is on a similar level and sampled voices signal the end of a level.

If you enjoyed *Pengo* on the Beeb, you will love *Poizone*. It's not state-of-the-art but at twenty quid, it is good, wholesome fun for all those would-be planet-savers!

**Rob Miller** 

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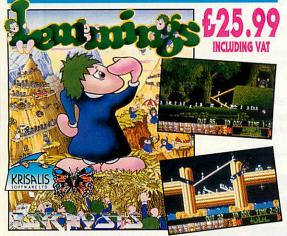
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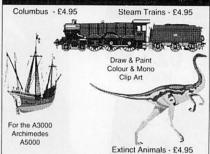
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8-chip design ensures low power consumption. Compatible with ARM3 upgrades, backplanes, hard discs etc. Four-layer circuitry reduces electrical noise for trouble-free operation. The 2Mb upgrade may be upgraded to 4Mb later. A copy of the fitting instructions is available free of charge.

A complete fitting service is available for our RAM boards covering courier collection, installation and testing, MEMC1a, return delivery and guarantee. This is normally a three-day service (eg, collected Monday, returned Wednesday). We have been upgrading 300 series computers for well over two years, and during that time a reliability record second-to-none has been established.

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#### **RISC-OS 3 Carrier Board**

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details of the new range if they decide to go ahead!

#### **STAR GAZING**

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We continue our series on the sound capabilities of the Archimedes by looking at some standards for use in samples. We'll also be showing you how you can incorporate sounds into your own programs

## PLUS

#### C YOU...

Dave Acton concludes his series on C programming with a routine which helps you to construct a year planner for birthdays and other diary entries

#### **ABUSER RETURNS!**

Just when you thought it was safe to go back into our editorial pages - Acorn Abuser is back! We rake over the coals of BAU's first ten years and revisit the column you all loved to hate

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I am a doctor working in I am a doctor working the health service. would like to put together a database of various scientific papers but rather than create my own, wondered if there was a professional one for the A3000. I know there's one called EndNote for the Mac. Is there a similar one for the Archimedes?

K Rhodes West Bridgford Nottingham

Scientific databases sup-A Scientific datasets fairly small and very specialised. The way they work is as follows: at regular intervals, the subscriber receives a disc containing the latest update, which is usually a list of 'abstracts' of papers published in particular journals.

As far as we know, there are no such postal databases specifically for the Archimedes format, but there are many aimed at the PC and published on low density Dos discs which your A3000 could read under its PC emulation.

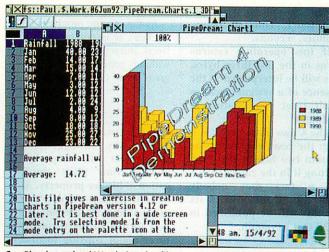
But in fact we would suggest another option. If you buy a Modem and appropriate comms software (such as Hearsay2 or ArcTerm7) you can subscribe via the international packet switching network (PSS) to academic databases all over the world. These are much bigger than their postal relatives; they're updated as each new journal is published and hard copy of papers you're interested in can often be ordered at the touch of a button.

Connection charges are sometimes expensive but you can save a lot of money if you download abstracts to your computer, rather than read them on-line. Talk to British Telecom about Telecom Gold and PSS.

I have a BBC Model B computer and would like to run View and other software on it. I have recently obtained an Aries B12 board (with a number of Roms) and would like to connect it to my computer. Unfortunately I do not have the smaller board and ribbon cable needed, or the

# ESTIONS

# **ANSWERS**



Can Pipedream load Wordwise Plus files?

utility discs to go with Printmaster. Please can you suggest where I can obtain these items or, if this is not possible, which socket I can plug the View chip into.

> A Larcombe Bridgend Mid Glamorgan

Sad to say, the Aries A Sau to Say, ..... B12 board is out of production and the small board that connected it to the beeb is unavailable.

Since the PCB in question is a quite specialised twolayer design, it's probably cheaper to buy a whole new Rom board than to make one replacement. So, unless any kind soul out there has the component you need and wants to come to an mutual arrangement, the B12 is of no use to you.

The good news is that you still have a bunch of Roms that may come in handy. To fit a Rom in your beeb, take the lid off and then undo the two bolts which hold down the keyboard. This will

reveal a row of five large sockets on the right hand side of the main board, at least three of which will be occupied by the operating system, the DFS and Basic, none of which you should remove. If the two remaining sockets are vacant, you can install your applications in either but take care not to bend the legs on the Roms (a long thin screwdriver is useful at this point).

If there is already something there, you can either swap it or buy a new board (solderless Rom/Ram boards for BBC Model B are about £40 plus VAT). Once installed, Printmaster work without utilities, just type \*HELP PRINT MASTER for a list of commands.

I have a dissertation which was typed out for me on a BBC Model B using Wordwise. The text is on two 5.25in discs. Is it possible for me to transfer the information onto 3.5in discs to be loaded into Pipedream on an A3000? I don't have the Wordwise software but I do have access to a Master 128 and a Hybrid disc drive.

> A Hodgkinson Fenham

Newcastle on Tyne Pipedream does not A read Wordwise files in their native format. In order to transfer them, you must first get on to a BBC machine with Wordwise on board, load up each file and then use the Spool option to save a text-only version under a new name. These files can then be copied across to a 3.5in ADFS disc

#### PROBLEM SOLVED

In May, we featured a problem from W Briggs of Co. Down concerning a Canon BJ330 wide carriage printer on which he was trying to print A2 size posters. He was using an LQ850 printer driver and, unless it was set to continuous paper the printer gave an automatic form feed after the first 11 or 12 inches of the 23.5 inch sheet. Keith Archer, customer services manager of Watford Electronics, has met this problem before and wrote in with a 'nice fix' as follows:

Make a copy of the Acorn PrinterDM application on a separate disc. Open the PrinterDM icon and load the text file PrData into Edit. Locate the line which reads Job Prologue, followed by an empty string "" and, between the quotes, type the following escape sequence:

<27><67><0><22>

This sequence should also be added, within the existing quotes, to the two Job Prologue sequences further down the listing which control Draft and NLQ print modes. The Job Prologue has got nothing to do with the Old Testament, it sets the printer up before sending text to it. In this case it sets the page length to the maximum available, 22 inches. Once the new version of PrData has been saved the alternate PrinterDM can be used for large scale printing simply by installing it on the desktop instead of the usual driver. Thanks Keith!



The exclusive BAU knitting program

on the Master 128 and loaded into Pipedream. All text formatting done in Wordwise (bold, underline etc) is lost in the process and will have to be done again but that's probably why you're moving to the A3000 in the first place!

Please could you tell me how to read the time from either the Econet clock or the fileserver? I need to know this because at college the clocks on network Archimedes are incorrect, especially since the clocks went forward an hour.

Also, do you know why, when Cmos Ram is reset by holding down delete and switching on the power, the year on the internal clock is changed to 1988?

> T Kimber Fleet Hants

You can get date and time from your network server using Osword &14. When you make the call X% and Y% should point to a block of, say, 16 bytes of which the first eight bytes should contain the following decimal values: 0, 15, 0, 16, 0, 0, 0, 0.

On return from the OS call, the first four bytes contain a zero, then the number of bytes returned, a command code which you can ignore, followed by an error code. If the error code in byte three is non-zero, the operation has failed; otherwise bytes four to eight of the block now contain date and time as follows:

Day, Year since 1981 (top four bits) and Month (bottom four), Time in hours, minutes, seconds.

If this operation returns zeros in the last three bytes, this will be interpreted as the absence of a system clock, so don't reset your station at midnight!

The Cmos Ram error is a bug; the reset only reads the bottom two bits of the year, putting it in the range 1988 -91, a fact that nobody noticed until this year. A fix for this will be published in \*INFO next month.

A5000 and wish to fit it with a suitable 5.25in disc drive to use 1.2Mb MS-Dos floppies. On p36 my User Guide tells me that this format is supported and then tells you to contact 'your supplier'. This is where it all comes to a stop. Please help!

A Norris Basingstoke Hants

It's possible to connect the A5000 straight to an additional drive by a 34 pin IDC cable and then alter a link on the circuit board to tell the computer what sort of drive it is, but this is not recommended.

In cases like this, it is often better to install a well designed interface between the two devices to protect your precious machine from whatever drive you've decided to stick on the end of it. As the A5000 is still new to the marketplace, no-one is selling such an interface yet and, since the Dos 5.25in HD format is steadily dying out, it's doubtful that anyone ever will. Therefore, until some enterprising hardware person proves it wrong, try to get your 1.2Mb discs transferred onto 1.44Mb Dos discs which your machine can read easily. If you're regularly transferring data from a particular PC, seriously consider buying a 3.5" drive for it.

I first became interested in computing nine months ago when I bought an Electron in a car boot sale. As I own a disc drive, I would like to put my commercially bought programs, which are on cassette, onto disc.

As the cassette programs are 'locked', it is not possible to Break and retrieve the program without getting a 'Bad Program' error. Can you help?

K Lillis Tooting London

A If software is included the way you suggest, it is If software is 'locked' in to protect the copyright holder from illicit duplication of his/her property. As cassette is an obsolete (or near obsolete?) format, it's best to talk to the manufacturer about copying to disc. They may be willing to help, for a small fee.

Sorry we can't be of more help; as far as we know, noone has yet been prosecuted for incitement to software piracy (on or off the high seas), but we don't plan to be the first!

I have several questions about upgrading my A3000 to Risc OS 3 and, briefly summarised, they are as follows. When is the upgrade due out? What will it cost? Will you need bigger Rom sockets to fit it? Will the existing A3000 disc drive be able to read MS-Dos and Atari discs without special utilities?

> T Wiser Lea Bridge Derbyshire

Acorn have not yet fixed a price or release date for the Risc OS 3 upgrade but it is expected to be launched by the end of this year. The Rom sockets in the A3000 are big enough to take the new chips, although users of Archimedes A300 series and early Archimedes A400 machines will need a small expansion board to accommodate them.

With Risc OS 3 installed, you will be able to load, format and copy 720K MS-Dos discs without extra utilities. Atari discs would require appropriate software but high capacity discs of any sort (A5000 1.6Mb, MS-Dos 1.44Mb, Mac 1.44Mb.) will remain unreadable without a high density disc drive.

I am writing to ask about knitting design programmes on the BBC Model B. I have heard on the grapevine that BAU published such a program in the past. Could you advise me whether this is the case. And if so, in which issue?

> V Chicot Pulloxhill Bedfordshire

In December 1989, we published a programme that converted screen images on the BBC into knitting patterns on paper. It can also run on the Archimedes series with a few modifications.

You can buy back issues from our mail order distributors in Wetherby by phoning (0937) 842489.

#### **HELP US TO HELP YOU**

The Questions and Answers page is your chance to have your problems solved. They can be on any topic - you name it and we'll try to solve it. Please send your questions, whether technical or otherwise, to:

> Richard Garrett, **Questions and Answers BBC Acorn User** 20-26 Brunswick Place London, N1 6DJ.

We are happy to answer your queries on these pages, but regret that we are unable to send personal replies to questions sent in. If you send a disc, please put your name and address on the disc itself. It is also useful if you could include full details of your machine, marking your envelope as eightbit micro or 32-bit A3000, Archimedes or A5000.

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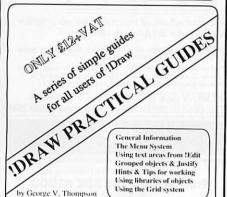
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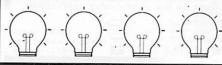
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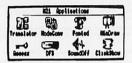
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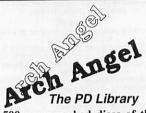
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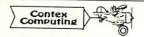
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# LETTERS

#### £15 STAR LETTER

I run a small company which uses an IBM PC for day to day letters, accounts, and so on. Due to the increasing number of reports and special newsletters which we need to produce, I have been thinking seriously about desktop publishing.

Because I would need an additional machine to use for DTP (the PC is very tied up as it is), I decided to look further, and have been considering an Apple Macintosh set-up with Quark Express software.

While on a visit to the recent Which Computer Show I came across the Acorn Computers stand and had a chance to look at the A540 running Impression software. I was impressed by the set-up and the price, which seems attractive compared with a PC or Mac-based system. I know that you published a comparison between the Arc, PC and Mac last month, but have you done a head-to-head comparison of DTP systems based around these machines.

> R Green Sevenoaks Kent

Well, the review last month did include a small section on the relative merits of each system for DTP, but we are looking at other articles in the future which will focus on specific solutions offered the Arc and its by competitors.

Meanwhile you may be interested in reading a DTP comparison carried out by Norwich Computer Services. Called Desktop Publishing on Acorn Systems, it costs 75p from NCS, 96a Vauhall Street, Norwich NR2 2SD.

#### SHOOT 'EM SIDEWAYS

I'm writing in response to Daniel Zerafa's letter (BAU June 1992) asking for a proper horizontal shoot-em-up in the tradition of R-Type I and II.

The Scorpius project was initiated by myself because I have been an R-Type fan for many years and I knew that the Arc was capable of running such a game. Scorpius features all of the complexities of the R-Type style games as well as



The complete DTP system, featured in this month's competition

alien intelligence, fully animated sprites that are almost full screen in size, and two way parallax scrolling. Scorpius pushes a standard A3000 to the limits in terms of processing power, with over 150 custom sprite routines as well as employing complex mathematics to depict special effects from falling snow to the damped motion of hanging objects. The four man development team on Scorpius have been working on the game for almost two years, and the release date is September 92.

If any of you have any thoughts or suggestions please write and we will consider them for future releases.

> O Jagpal Arxe Systems Ltd PO Box 898 London E79RG

#### **EXCELLENT COMPARES**

I am writing to say how good I think BBC Acorn User is looking these days. As a long term reader I have watched the development of the magazine with interest and its latest incarnation is, I must say, a pleasure to read.

I rather like the nifty new logos at the tops of the pages, particularly the one on the news pages, and all the colour makes it very easy on the eye.

And what about the content of the last issue? Well, I found the article on the Arc versus the Macintosh and PC extremely interesting, not to say courageous. As an Acornonly publication you must have been pretty confident the Arc would come out on top in the majority of areas, as it would have been a bit embarrassing to have to tell readers to go out and buy a PC instead, wouldn't it! Anyway, I for one was pleased to see that you found the A5000 is the best all-round machine for the best price. Keep up the good work!

**B** Marwood Wetherby Yorkshire

Obviously we have long known that the Archimedes is, in most cases, streets ahead of the competition, although we endeavour to be as fair as possible when assessing it with machines from other environments.

#### ON THE OPEN ROAD

I attended one of the Acorn Open days in Bristol recently. I didn't really know what to expect, and found that it was a very interesting and worthwhile day.

Apart from having the opportunity to see the latest Acorn machines, and use them, it was a real eye-opener to see how good the software support is for the Archimedes and indeed how helpful the software companies were who attended that day. I also enjoyed seeing your good selves at the roadshow and was persuaded to take out subscription to your excellent magazine. Are the Open Days continuing throughout the year and, if so, do you have details?

L Shipley Canterbury Kent

The Open Days have certainly been a great success, and there are plans to continue with them until the end of the year. Venues have yet to be finally confirmed, but we have listed below the towns and cities which Acorn is planning to visit. Watch BAU for further details.

Cambridge, June 20; Milton Keynes, 21; Bournemouth, 27; Shanklin, Isle of Wight, 28; Birmingham, Sept 12/13; Portsmouth, 19; Colchester, 20; Blackpool, 26; Oldham, 27; Bolton, October 3; Sheffield, 4; St Helens, 10; Rotherham, 11; BBC Acorn User Show, Wembley, 16-18; Swindon, 24; Slough, 25; Nottingham, 31: Stoke on Trent, Nov 1; York, 7; Northampton, 8; Middlesborough, 14; Hull, 15; Derby, 28; London, 29; Computer Shopper Show, Dec 4-6; Bradford, 12; Leicester, 13.

For further details about the Open Days, contact Acorn on (0223) 254200.

#### NETWORK HINT

Owners of the new A5000 might like to know of this handy hint that will save 'loads' of time while working on Econet. Directory viewers full of Impression documents or applications take a long time to open, because the Boot files have to be executed and the Impression sprite loaded into the wimp sprite pool. On an A5000 this can be stopped by holding down CTRL when opening a viewer.

G Catton Surbiton Surrey

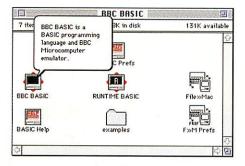
Here at BAU all of our layouts Impression are stored in individual folders. It does involve one extra double click, but in the long run this method saves time.

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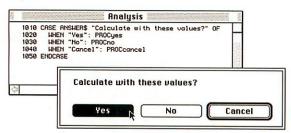


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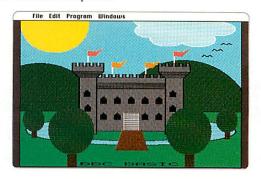
**Macintosh Toolbox interface** allows you to define your own menus, dialogue boxes, and scrolling lists using convenient BASIC keywords, and use the standard file dialogues for opening and saving data files.

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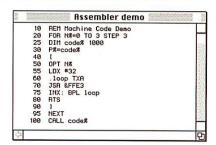
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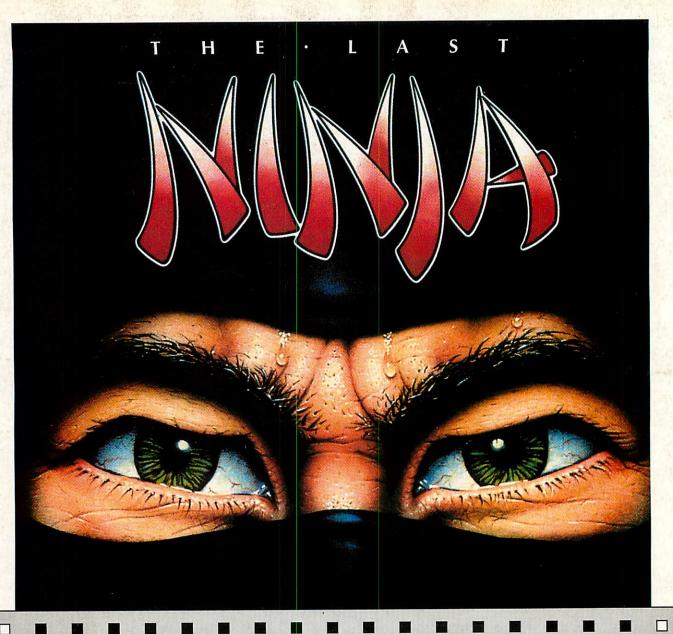
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